FUTURE US NAVY FORCE PROTECTION

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This study deals with providing force protection for the Navy?s future, minimally manned surface combatants. Following the attack on the USS Cole, force protection became the Navy?s primary warfare concern. In order to add experience and defensive depth, United States Coast Guard Port Security Units augmented Navy ships? force assets in providing Antiterrorism and Force Protection. Concurrently, the Navy set out to build the next family of surface combatants, the DD (X) class. One of the cornerstones of the program, as specified in the operational requirements document (ORD), is that the DD (X) have an ?optimally sized? crew of 95, not to exceed 150. This is nearly a 70 percent reduction from surface combatant crew sizes of today. How can the Navy reasonably expect to provide force protection for minimally manned combatants when it is having trouble doing so today? This study examines the tasks required to provide adequate force protection, the manning required to perform those tasks, and the associated manning costs. The analysis determined that the new DD (X) class will only be able to perform the force protection tasks if manned near the 150 personnel mark, and even then will require a security augmentation force, such as a Port Security Unit.

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ABSTRACT

FUTURE US NAVY FORCE PROTECTION, by LCDR John M. Zuzich, 106 pages.

This study deals with providing force protection for the Navy's future, minimally manned surface combatants. Following the attack on the USS *Cole*, force protection became the Navy's primary warfare concern. In order to add experience and defensive depth, United States Coast Guard Port Security Units augmented Navy ships' force assets in providing Antiterrorism and Force Protection. Concurrently, the Navy set out to build the next family of surface combatants, the DD (X) class. One of the cornerstones of the program, as specified in the operational requirements document (ORD), is that the DD (X) have an "optimally sized" crew of 95, not to exceed 150. This is nearly a 70 percent reduction from surface combatant crew sizes of today. How can the Navy reasonably expect to provide force protection for minimally manned combatants when it is having trouble doing so today? This study examines the tasks required to provide adequate force protection, the manning required to perform those tasks, and the associated manning costs. The analysis determined that the new DD (X) class will only be able to perform the force protection tasks if manned near the 150 personnel mark, and even then will require a security augmentation force, such as a Port Security Unit.

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Finally, to my family. I apologize for the stress I created and shared over this paper. It's time to go back to sea.

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ACRONYMS

AT/FP	Antiterrorism/Force Protection
CDO	Command Duty Officer
CO	Commanding Officer
COMET	Cost of Manpower Estimation Tool
DoD	Department of Defense
FPO	Force Protection Officer
IBU	Inshore Boat Units
OJT	On the Job Training
ORD	Operational Requirements Document
PSU	Post Security Units
ROE	Rules of Engagement
SMD	Ship's Manning Document
SSDF	Ship's Self Defense Force
THREATCON	Threat Condition
TPSB	Transportable Port Security Boat
TTP	Tactics, Techniques, and Procedures
XO	Executive Officer

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CHAPTER 1

INTRODUCTION AND BACKGROUND

> It is our task to make sure that we deploy forces always that are credible and ready to go in harm's way. Well, let's talk about the world today. Here's a thumbnail sketch: It's still unpredictable. It's rapidly changing. It's dangerous and it can be deadly. Note the USS COLE.
>
> Admiral Vern Clark

Introduction

The tragic events of 11 September 2001 were a somber reminder of just how true Admiral Clark's words still are. Yet the US is a maritime nation, bounded by the ocean. As part of its national security strategy, the United States continues to engage the rest of the world. Key to this engagement is the ability to show presence. The Navy is perhaps the military branch best suited for a presence role, commanding the seas which provide transportation for 90 percent of all international trade and which border 222 of the world's 265 countries (Lautenbacher 2001, 1). As seen in Afghanistan, the Navy also provides the potential capability and flexibility to act unilaterally, if necessary, needing only the international seas for operating space. To continue serving the nation's interests, the Navy must continue providing a strong forward presence.

This forward presence may require operations in unfriendly waters. To continue these operations, the Navy must also always be prepared to defend against conventional and unconventional attacks. Following the terrorist attack on the USS *Cole*, force protection has become a top priority of the Navy's leadership. A great deal of time and money has been allocated to increasing the security of naval bases, while both Coast Guard and Naval Reserve units have been activated to provide improved port security

overseas for deployed vessels. The Surface Warfare Development Group has developed several force protection tactical memorandums, attempting to standardize ships' employment of their ship's self-defense forces (SSDFs). However, many ships' commanding officers (COs) have complained that it is difficult, if not impossible, to comply with these increased watchstanding requirements while the ship is inport and the crew should be recovering from arduous underway periods. These problems are occurring with ships that have as many as 350 sailors. Concurrently, the Navy is attempting to create a new class of destroyers, the DD (X) class, which may be manned with as few as ninety-five sailors. Can these ships be reasonably expected to station a viable SSDF if fully manned ships today cannot?

To examine this problem, the primary research question is: How will the Navy provide credible force protection for future, minimally manned surface combatants? To evaluate this question, three key areas must be fully examined. First, the threat must be addressed. What is the nature and extent of the current and future terrorist threat to the maritime service? Next, the force protection requirements and added technology designs of the next class of surface combatants must be reviewed. How will this "minimally manned" ship be manned, and what technologies will be used to "augment" those sailors in a force protection role? Finally, Navy force protection must be examined. How does the Navy currently perform the force protection task? What shore commands does the Navy use to supplement ship forces? How are surface combatants of today and tomorrow organized to perform force protection? How will new manning requirements of the DD (X) class drive changes in force protection procedures? By answering these questions, a possible solution for future force protection will be presented.

Definitions

Prior to discussing the future Navy force protection structure, it is important to define some of the key concepts.

Force Protection. For the purpose of this thesis, force protection will broadly encompass any action that is taken by the Department of Defense (DoD) or other governmental agency to detect or deter terrorist activity against a DoD asset.

Minimal Manning. May also be referred to as optimal manning. Decreasing Navy vessel crew size by moving shipboard administrative duties ashore, replacing shipboard efforts with labor saving technology and altering traditional watchstanding duties (Brown et al. 2000,18).

Naval Tactical Doctrine. The Surface Warfare Development Group is the surface Navy's voice in developing tactics, techniques, and procedures (TTPs) for any warfare area. It takes a fleet commander's guidance and fleet input to generate these TTPs and to distribute them in the form of a tactical memorandum. These tactical memorandums are considered interim tactical guidance. These tactics are then used and evaluated by deploying units. Once the tactics are finalized, the fleet commanders submit them to the Naval Doctrine Command for release as a naval warfare publication, the Navy's tactical doctrine.

Operational Requirements Document (ORD). A formatted statement listing key operational parameters for proposed systems.

Port Security Unit (PSU). In this discussion, port security unit refers to a deployed, shore-based unit, which supplements a deployed naval asset. These PSUs may be naval coastal warfare inshore boat units (IBUs), Coast Guard PSUs, or Marine Corps

FAST (Fleet Antiterrorism Support Teams) units. PSUs augment the SSDF teams for deployed protection. FAST units are teams from the Marine Corps FAST company, an elite group of 321 men trained to assist local security forces, as directed by the Chief of Naval Operations, when threat conditions are elevated (Marines On-line 2001, 1). These must be differentiated from SSDF teams comprised solely from ship's force personnel.

Ship's Self-Defense Force (SSDF). Armed sailors of a ship's company who provide the capability to augment onduty watch standers to provide a vessel security from sabotage, damage or compromise (Dept. of Navy 2000).

Smartship. An initiative which placed automated systems and sensors onboard AEGIS class guided missile cruisers in an attempt to reduce the number of personnel assigned.

Surface Fleet. Discussions of surface combatants broadly refer to cruiser, destroyer, frigate or smaller class surface ships. Generally, aircraft carriers and large deck amphibious ships are already augmented with a Marine Corps detachment to supplement the ship's force in providing force protection. Therefore, this paper will deal address requirements for carriers or amphibious ships.

Training Cycle. The Inter-Deployment Training Cycle is the deployment preparation process for surface combatants, made up of several milestones. The first milestone, the commander's assessment of readiness and training, is actually completed during the middle of a current deployment, planning for the next upcoming deployment cycle. During the Commander's Assessment of Readiness and Training, the ship reviews its formal schoolhouse training requirements and submits a plan to its immediate superior for completing those requirements. Approximately six to eight months before deploying,

the ship will go through its second phase of the Commander's Assessment of Readiness and Training. This phase is an administrative review of required combat systems, engineering and training programs. Once this administrative review is successfully completed, the ship must demonstrate combat systems, engineering, and damage control watchteam proficiency through completing both an integrated tactical scenario and a more basic engineering drill session. Approximately two to three months later, the ship will complete its individual, or basic training phase, by demonstrating engineering proficiency through an underway-engineering demonstration, and its integrated watchteam proficiency by completing a twenty-four-hour battle problem known as the Final Evaluation Period. The ship then joins its squadron and the battle group for intermediate and advanced underway training sessions prior to deployment.

Assumptions

In this thesis, there are three key assumptions. The first is that the Navy will indeed press ahead with the DD (X) class as a minimally manned surface combatant. This program was formerly called the DD21 program. The program description, objectives, and solicitation request were released, and two teams were formed to develop an initial design concept and submit contract bids. The Joint Requirements Oversight Council (JROC) approved the mission needs statement on 26 September 1994, and the ensuing Cost and Operational Effectiveness Analysis, completed by the Navy, resulted in the Operational Requirements Document (ORD) approval by the JROC on 16 September 1997 (Cooper 1999, 1). Both design teams had completed design analysis and bid submission, but in May 2001 the Navy announced that it was delaying source selection until after the completion of the DoD organizational review (Federation of American

Scientists 2001, p. 12). Based on the organizational review, and the keen awareness of focusing on true transformation, the Navy announced on 1 November 2001, that it would release a revised request for proposal to the two competing teams. This change is expected to direct the development of a family of ships, based on common technology and hull form, to meet the variety of threats and environments the Navy will encounter in the decades to come (Navy Times 2001, 1).

The next assumption is that the additional technologies installation concept will be similar to that already in use in the Smartship program. The Smartship program is already in use on Aegis class cruisers, where key technology installations, such as an Integrated Bridge System and a Shipboard Machinery Control System, allow fewer people to more effectively manage ship engineering and maneuvering systems. Although the technology will not be the same, it will still be designed to perform automated maneuvering, engineering, and damage control functions in order to reduce manning. Similarly, it is expected that other Smartship technologies, such as the Coordinated Onboard Physical Security (COPS) system, a system of surveillance cameras and access control stations throughout key areas of the ship, will be implemented to enhance the smaller crew's force protection situational awareness. Finally, as stated above, the IBUs have just recently completed their first full deployment, so all tactics, functions, training, and costs of the deployed IBUs will be assumed to be similar to data obtained from the Coast Guard's PSUs.

Limitations

First, this paper will be limited to unclassified discussions. While many ship capabilities and limitations are classified, the force protection tasks they must accomplish

are not. Therefore, this paper will deal with shipboard force protection tasks and the manning required to carry them out, not the actual tactics used. Also, the only case examined will be a surface ship in port. At sea, the ship is in her fighting element and is able to use speed and maneuverability, as well as weapons, against a potential adversary. In port, the ship does not have this luxury. Therefore, this paper will only consider the hardest force protection environment, the ship in port.

Next, the DD (X) contract has not yet been awarded, so exact crew make up and exact technology to be incorporated is not decided. However, there is enough literature from the program manager on the Internet and from interested parties in professional forums, such as *Proceedings*, to mitigate this limitation. Finally, since the Navy's IBUs are still in their maiden deployment, information from the IBUs is limited. Much of the standard operating procedures used by the IBUs are borrowed from PSU doctrine. Therefore, the PSU will be used as the representative shore-based security augmentation force for this paper.

Delimitations

As alluded to in the definitions, the Navy's surface combatants can be generally divided into three categories: aircraft carriers; amphibious ships; and cruiser-, destroyer-, and frigate-sized combatants. Carriers and large deck amphibious ships already have Marine detachments assigned to supplement the ship's force personnel in a force protection role. The research for this thesis will concentrate on force protection material germane to the smaller surface combatants. Likewise, since the topic deals with force protection for minimally manned combatants, the scope of research for manning will be limited to the Smartship Aegis cruisers and the DD (X) classes. Finally, the rules of

engagement (ROE) are crucial to the understanding force protection. However, ROE are theater specific, and although they may alter how tasks are performed, they generally do not alter the types of tasks performed by security forces providing force protection. Therefore, ROE will be considered a constant variable and will be discussed.

Background

"In Aden, the young men rose up for holy war and destroyed a [ship] of injustice" (CNN Online 2001). These are the words used by terrorist Osama bin Laden to praise the act which killed seventeen sailors, injured another thirty-nine, and crippled one of the most technologically advanced warships ever built. Intelligence sources indicate that this attack emboldened not only the successful attackers, but also other would-be assailants. In fact, there were two more successful maritime suicide attacks later that same month, one against the Israeli Navy by HAMAS and one against the Sri Lankan Navy by the Liberation Tigers of Tamil Eelam (Gunaratna 2001, 1). At home and abroad, the Navy enhanced its force protection posture, amid warnings that "the rise of non-state sponsored terrorists may also increase the possibility of attacks on military bases located in the United States" (Saxton 2001, 2).

With financial backing from states such as Libya and Iran, and backing from nonstate actors, such as bin Laden, the terrorist threat continues to loom and grow both overseas as well as at home. This is largely due to the fact that the terrorists see themselves as more than just actors on a political level. They are driven by their political and religious leaders to believe their fight is one about religion and culture. Their culture is being swept away by the Western cultures, led of course by the United States, making the US the terrorists' chief nemesis (Saxton 2001, 2). In this electronic age, smaller,

more efficient group cells align together, sharing wealth, technology, and information together, thus breaking down traditional geographic barriers in order to attack their common enemy (Pollard 2001, 1).

But since this fight is not necessarily a traditional military fight and because the terrorists' resources are relatively limited, they do not need to attack in traditional methods. Their tactics are more narrowly aimed at delaying, denying, disrupting, and demoralizing US forces. They are not interested in an immediate large-scale battle and victory. Rather, they are content with small successes, which can bring them notoriety while dealing their adversary an embarrassment (Stone 1999, 4). These small successes will eventually bring overall victory. Further, these attackers generally have the elements of surprise and unpredictability and are extremely difficult to defend against.

Maritime terrorists also have the environment as an advantage. The attackers, depending on their funding and proficiency, may choose various routes of attack along the land and sea interface. Already proven, low technological and simple-to-deliver systems, such as car and truck bombs or small craft laden with explosives, continue to be popular. As previously alluded to, after *Cole*, the terrorist group Hamas nearly sank an Israeli patrol craft, while the Tamil Tigers succeeded in sinking a Sri Lankan personnel carrier using this same method. Other low technology options, such as rocket propelled grenades, gliders, microlights and sea mines are also being used (Gunaratna 2001, 3)

Groups with greater resources are trying far more sophisticated methods. The Popular Front for the Liberation of Palestine was the first of many groups to receive underwater demolitions training from Yugoslavia. These trained groups have also invested in rebreather units--military-use scuba gear that does not emit bubbles,

decreasing the chance of detection. Two groups, the Tamil Tigers and the Revolutionary Armed Forces of Columbia, have been caught building midget submersibles. Finally, the groups continue to be not only sophisticated but also ingenious. The Basque Homeland and Liberty of Spain group successfully damaged a Spanish warship using a remote-controlled boat (Gunaratna 2001, 5-8).

To show just how difficult it may be to defend against such an asymmetrical attack, the most infamous maritime terrorist attack, the bombing of the *Cole*, is considered. The *Cole* was on deployment and had just transited the Suez Canal. She made a scheduled brief stop for fuel in Aden, Yemen, on the morning of 12 October 1999. This trip to Aden was not out of the ordinary. In fact, *Cole* was the thirtieth ship to stop in Aden since September of 1997. On that morning, the threat level was assessed by the fleet commander as high, and threat condition (THREATCON) Bravo was set. Under THREATCON Bravo, which is set when an increased and more predictable threat of terrorist activity exists (NCIS 2001, 7), there are sixty-two separate measures for commanders to take into account. Prior to pulling into a port, the ship would report to Commander Task Force Five Zero (in Fifth Fleet area of responsibility), which measures were in effect (NCIS 2001, 13-18). While the *Cole* reported that all of the security measures would be in place, only thirty-one were truly executed. In fact, the ship did not appear to be concerned with force protection at all. No security boats were in the water to inspect or ward off would-be attackers; no watchstanders were on the bridge to control the flow of small craft approaching the warship; the duty section was not properly briefed; no senior leadership was topside to direct the SSDF efforts (Dept. of Navy, 2001, 9).

Despite this seemingly carefree security posture, the Commander in Chief, U.S. Atlantic Fleet, Admiral Robert Natter, and the Chief of Naval Operations, Admiral Vern Clark, concluded that the CO acted reasonably in setting the ship's force protection posture based on the information he had been provided. The *Cole* had, in fact, been praised prior to deployment for the robustness of their force protection plans. All accounts depict the attackers as jovial, smiling and waving to the crewmembers on deck, just prior to the explosion. Even with a full security posture, under the standing ROE, it would be a far stretch to assume a hostile intent and thus use deadly force to stop the terrorists (Dept. of Navy, 2001, 9). Many believe that the use of force, even nonlethal force, such as fire hoses, would have risked possible innocent lives and an international incident (Brown 2000, 1). Indeed, a similar incident occurred the previous July in San Juan. While a group of protestors gathered along the downtown wharf where USS *Yorktown* was berthed, a kayaker approached the ship's stern. The crew attempted to move the kayaker away with a fire hose, but stopped when it was seemed the kayaker was unarmed and was clearly unable to stay upright. The crowd also grew more restless watching their comrade being flushed with the high-pressure water stream, aiding in the ship's decision to stop. The crew merely watched as the protester painted the ship's stern (Hawley 1999, 1). It is highly unlikely this story did not catch several groups' attention.

Does this mean that the *Cole* attack could not have been prevented, and any similar future attacks will also be successful? Certainly not. In fact, the assigned Judge Advocate General manual investigating officer believed twelve key security measures, such as a waterborne patrol and additional, armed topside sentries, were disregarded that may have prevented the attack or mitigated the results (Dept. of Navy 2001, 9). Further,

the judge advocate general's investigators looked at the overall Navy force protection policy for key areas that may have prevented the attack. They concluded that the Navy needed to do a better job in manning, equipping, and training surface combatants in the force protection realm. The Navy immediately began to do this. The operational and administrative commanders funded the force protection allowance equipage lists (AELs) that pushed vital force protection gear, such as tactical vests and small arms, to their ships. They also mandated that force protection training scenarios be added to the predeployment training phases for carrier battle groups (CVBGs). The Secretary of Defense chartered a commission on the attack of the *COLE*, led by retired Admiral Gehman and retired General Crouch, to look for possible DoD procedural and policy changes that were required to ensure such an attack would be prevented in the future.

The Navy acted quickly on the recommendations made by the *Cole* commission. Chapter 2, "Literature Review," will discuss this review and the development of force protection doctrine. It will also look at how force protection is carried out today and project the crew organization for the future surface combatant.

CHAPTER 2

LITERATURE REVIEW

Men mean more than guns in the rating of a ship.

John Paul Jones

Doctrine

Although released in March 1998, the joint staff publication regarding tactics, techniques and procedures (TTPs) for antiterrorism is still relevant to the problems experienced today. It maintains that the goal of terrorism is to make such a profound effect that the US responds by altering its national policy and objectives and that this response is altogether unacceptable. Therefore, although the DoD does not have the lead for all governmental agencies to combat terrorism, it is a key player. Further, the individual unit commanders' authority and responsibility to protect a unit from possible attacks is stressed (Chairman, Joint Chiefs of Staff 1998, vii-x). The joint doctrine continues to address several key issues: national policy and objectives, DoD and other agency command and control relationships, military antiterrorism capabilities, employment of forces, legal considerations, and intelligence. Failures in several of these areas, according to the *Cole* commission, led to the successful attack in Aden.

In reviewing the DoD force protection policies, the commission concentrated on the areas of organization, intelligence, logistics, training, and, force protection at both the national and operational level. At the national organizational level, the task force found that better effort among all U.S. governmental agencies, from intelligence communities ensuring real-time intelligence is pushed to the end user, to the State Department in ensuring the security capabilities of host nations, is vital. At the operational

organizational level, the regional commanders in chief were identified as the link to the information from the national organizations to the end user. The deploying unit has neither the time nor the resources to keep abreast of all areas it will traverse, and the commanders in chief must ensure they have the organization in place to supply that situational awareness (Dept. of Defense 2001, 1-2).

For national-level intelligence, the commission stressed the need to shift away from Cold War intelligence gathering techniques. The US intelligence communities need to change their priority from the Cold War focus on other nations to the newer, smaller emerging threats in order to gain a greater advantage by improving our human intelligence and signals intelligence collection and analysis of terrorist cells. We must also innovatively use other national-level resources to follow our own forces and attempt to identify and predict possible protection shortcomings or attacks. At the operational level, users of intelligence products must be trained to ensure they request the right products (Dept. of Defense 2001, 2-3).

To address this intelligence shortfall, the Navy considered revising its "blue dart" threat warning system. Prior to the *Cole* attack, the Navy antiterrorism alert center would send a blue dart warning message to a unit only if there were credible intelligence that an attack on that unit was likely. This meant that in the event that intelligence was received regarding a likely attack, at an unspecified time and target, no warning messages would be sent. The less-restrictive criteria, meant to ensure all commanders are fed the necessary intelligence to protect their forces, are outlined in table 1. Now, a "red dart" protection message would be sent out with the highest precedence in order to warn commanders of an imminent threat. A "yellow dart" protection message would be sent to

any commander who may be affected by potential threats. The messages were also changed so they were read in three distinct sections: warning summary, details, and comments. Previously it was a free text format that contained both fact and analyst's conjecture. This was to ensure there was no guesswork involved for the commanders. They will now know the exact facts as the intelligence community has them and will have a separate paragraph with the analyst's thoughts on threat feasibility (Office of the CNO 2001, 1).

Table 1. Threat Warning System

Message Type	Imminence of Threat	Source Credibility	Message Precedence
Red Dart	Within 24-48 hours	Credible	Flash
Yellow Dart	Undetermined	Undetermined	Immediate/Priority

Source: Office of the CNO, CNO Force Protection Tasker

The commission only briefly touched on logistics. The committee felt there are certainly enough assets, both shore and sea based, to provide quality logistic support to the services. The component commanders, however, must adapt to operational circumstances and minimize the exposure of deployed units. The only other shortfall discussed was logistical operational security. The commission conceded that it is not practical to classify both logistics requests and diplomatic clearance requests, but decreasing the public's awareness of intended unit movements is a necessity (Dept. of Defense 2001, 2-3).

The final two areas of concentration, Antiterrorism/Force Protection (AT/FP) and training, go hand in hand. Before getting into the training aspects, one thing must be clearly understood; we say that terrorism is an asymmetrical threat, meaning it does not

follow the normal patterns of warfare. This is only true to the extent that we cannot reasonably predict the force, time, or target of the attack without intelligence. Many other aspects are what we would consider conventional. The attackers must spend some time planning and gathering reconnaissance. They must train, often times by running through rehearsals. Finally, they must deploy, actually getting near their intended target. It is in these three phases that properly trained, observant watchstanders' actions can defeat the attacking force. Therefore, by proper training, visualizing possible threats, and practicing against them, terrorism can be defeated (Rancich 2000, 67).

For this reason, the commission felt that more time should be spent in the predeployment training phase to develop ship's self defense force (SSDF) teams that are visibly prepared for the task at hand. The commission went so far as to recommend the AT/FP be trained as a primary mission area. In order to do this, clear standards for unit ability and evaluation must be developed; TTPs, which stress reactive defense as well as proactive measures to detect and deter terrorists, need to be developed; and standard equipment packages must be developed (Dept. of Defense 2001, 2). As discussed earlier, the Navy's type commanders are already doing this. The AT/FP scenarios are already woven into the commander's assessment of readiness and training tactical scenario and the final evaluation period tactical scenario. The AT/FP allowance equipage lists have been developed and that equipment is being delivered to surface combatants. Finally, naval TTPs are being developed as tactical memorandums by the Surface Warfare Development Group. The commission also made several important and interesting recommendations, including:

1. Service manning policies and procedures that establish requirements for full time Force Protection Officers (FPOs) will reduce force vulnerabilities.

2. Component commanders should augment transiting units with security forces.

3. Service AT/FP programs must be adequately funded.

4. More responsive application of available technologies can enhance AT/FP postures.

5. We must shift from a reactive protection posture to a posture which can detect and deter attack (DoD 2001, 3-8).

Many of these recommendations were quickly implemented, so we need to look at how the Navy addresses force protection for deployed combatants today. As already discussed, training has been increased and improved, and these better-trained forces are also better equipped. For example, the Enterprise carrier battle group, which deployed on 25 April 2001, received AT/FP training scenarios, including identification of improvised explosive devices, swimmer attacks, and small-boat attacks. While underway, the carrier battle group received additional training on both small surface craft attacks as well as low, slow flying air threats (Clark 2001, 2). The Navy's Fifth Fleet, the service component commander for the U.S. Central Command, has also implemented security augmentation forces for ships making port calls. This Maritime Security Augmentation Force, a small cadre of trained sailors and marines, performs area security checks on port facilities and husbandry craft, such as tugs, pilot boats, and water and fuel barges. The team also has Naval Criminal Investigative Service agents who work with local law enforcement agents to determine area threat level and agency responsibilities. They will

also do background checks on husbanding agents and service providers (Clark 2001, 2-3). Finally, they will embark the arriving unit to assist in SSDF employment.

Also supporting the augmentation force is the Naval Coastal Warfare Inshore Boat Units (IBU). IBU 15 started the IBU deployment rotation is July, relieving a Navy funded Coast Guard Physical Security Unit (PSU). Because the IBUs are still in their maiden deployment, discussions will center on the PSUs makeup and abilities, which are closely mirrored by the IBU. The PSUs and IBUs are reserve units, which were activated by a presidential selective reserve call-up order in February (Commander (Acp), 1). They are a self-contained force of 117 personnel, complete with berthing, messing, medical, and engineering support. They are transported by sealift or airlift and are capable of deploying within ninety-six hours of recall. The unit personnel are comprised of forty-nine boat crew personnel, fifteen C2 specialists, twenty-five security specialists, fifteen maintenance personnel, and thirteen support personnel. They employ six armed Guardian transportable port security boats (TPSB) (figure 1), each equipped with radar, night-vision equipment, and secure communications. The unit is further equipped with twelve .50-caliber machine guns, sixteen M-60 machine guns, thirteen grenade launchers, 107 M-16 rifles, forty Berreta 9-millimeter pistols, fifteen Remington shotguns, and antiswimmer grenades.

With these fully equipped personnel, they provide a credible pierside and waterside-layered defense (LANTAREA 2001). Figure 2 shows that the PSU will work with the local Navy commands, the ship and the host nation in setting up pierside security. The outer layer of shore defense is provided by a combination of USN/USCG personnel, establishing ac checkpoint to allow or deny access to the piers. Should an

assailant breach this area, PSU personnel are available to intercept and engage before the attacker can endanger the ship. Similarly, there are three waterside defense zones patrolled by the small, outboard motor powered TPSBs. The TPSBs can go outside the safety zone to escort warships coming into port. Once established, the TPSB will warn off in the safety zone, issuing warnings in both English and in the local language. Either the same or another TPSB will divert any aggressor in the security zone. This diverting can be by either simply impeding passage or using the small, powerful boat to shoulder away a would-be assailant. Depending on the threat, use of force may take place in the security zone. Finally, if an unauthorized craft should make it through the outer layers of defense into the reaction zone, the TPSB will decisively engage.

Figure 1. Transportable Port Security Boat. Photo courtesy of LCDR L. Handford, USCGR, Executive Officer, PSU 305

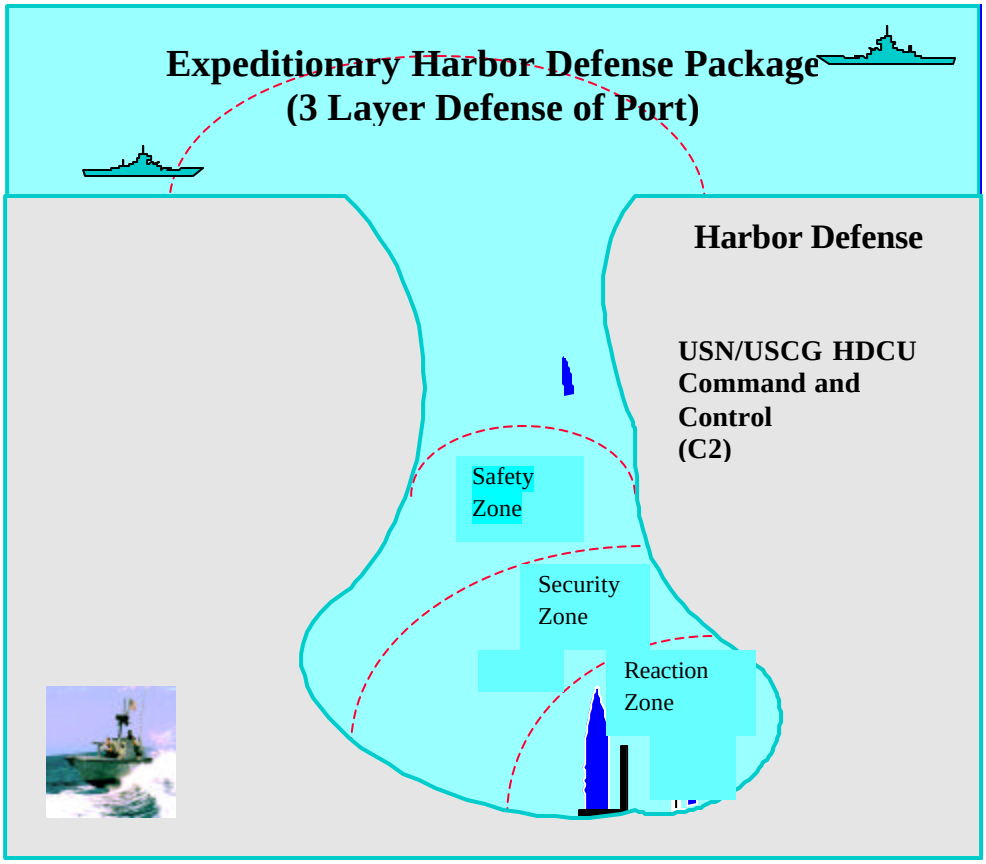

Figure 2. Expeditionary Harbor Defense Package. Courtesy of LT(jg) C. Harrison, USCG, PSU Coordinator, USCG Atlantic Area

The events of 11 September 2001 have also led lawmakers to help the Navy and Coast Guard teams for ports inside US territorial waters. Congress has mandated that the Coast Guard establish a naval vessel protection zone around all US Navy ships in US waters. Each ship, when feasible, will have a Coast Guard escort, which will enforce the zone. Unauthorized vessels may not approach within a 500-yard restricted area unless

allowed by the Navy or Coast Guard vessel. Persons violating this law face misdemeanor charges punishable by a $500 fine and up to six months in jail. Further, if the vessel continues in to a 100-yard exclusion area without authorization, the person in charge of the vessel faces class D felony charges punishable by a $250,000 fine and up to six years imprisonment (CINCLANTFLT 2001, 1).

Although formidable, it is not feasible to permanently station these PSUs at all of ports where the Navy performs its role of engagement. This means the ship's company, which has not had the benefit of formal, in-depth security training nor the luxury of having been permanently ashore, must provide the AT/FP posture. The Navy realizes this and is developing doctrine based on this defense in-depth approach. However, this approach is also incredibly manpower intensive. A ship must perform the following list of tasks (Rancich 2000, 68):

Table 2. Task List

Detect	**Defend**
-surface traffic within 3,000 yards	-prevent vessels from closing within 100 yards
-aircraft with 5 nautical miles (nm)	-engage aircraft within .5 nm
-establish personnel and vehicle entry points	-establish security zones w/armed watchstanders
-establish unloading zones	-define engagement areas
-100% ID and vehicle check	-employ counterswimmer measures
-conduct countersurveillance	
Deter	**Command and Control**
-intercept vessels at 3000 yards	-seamless communications
-clearly mark restricted areas	-establish reaction force
-conduct deception	-arm and equip security forces
	-coordinate with host nation

This is truly a daunting task. These young sailors, primarily trained for underway, naval surface combat actions, must now also be able to perform pier security. This pier security requires demonstrating a detailed understanding of ROE, public law, and status of forces agreements. They must also be able to work with the host-nation security forces. Further, they must provide waterside security also and demonstrate an understanding of host-nation right of visit and approach laws; boarding, sweep and inspection procedures; explosive device recognition; and anti-swimmer-diver techniques (SWDG 2001, 7-2). Filling all of these positions around the clock may require as many as seventy-two additional watchstanders. These additional watchstanders will be manning the small boats (4 personnel), manning .50-caliber and M-60 mounts (8 personnel), manning the bridge to direct small boats approaching the ship (1 person), and providing additional topside and pier roving sentry positions (5 personnel) on a six-hour watch rotation. Assuming the ship is a cruiser, with a complement of 350, and the ship is in 3-section duty, you can expect to have approximately 100 personnel in the duty section. If shore services are not available and the ship is required to provide its own power, then approximately twenty-five personnel will be performing engineering duties only. This leaves the duty section with three personnel to man normally required watchstations as well as damage control watchstations. Additionally, retention and quality of life concerns demand we expand to four or more duty sections, especially overseas. Young sailors joined the Navy to experience the world, not to see it from their ship's bridge wing while on duty (Clark 2001, 8). This is one of the many reasons why many commanding officers have complained that it is hard to comply with the new directives.

Manning

If it is hard to comply with these directives today, what does the future hold for surface combatants? The Navy has already embarked on a plan to install commercial technologies on ships to control both maneuvering and engineering functions. Smartship technologies were installed in 1996 in the USS *Yorktown* and have been determined to be operationally effective and operationally suitable for installation on all of the Aegis-class cruisers. These technologies are aimed at reducing the number of personnel required on each ship, while also allowing a greater proportion of the crew to concentrate on their war-fighting capability. The technologies also aim to increase the situational awareness of the war fighter by providing rapid, easily accessible information. Navy Smartship innovators have used the technology initiatives to save at least forty-four enlisted and two officer billets with each installation on an Aegis cruiser (U.S. Navy Chief of Information 1999, 7). Currently, funding is available for the installation on twelve cruisers, with the expectation of back fitting all of them under the Cruiser Conversion Program (Lautenbacher 1998, 3).

The cost savings from this small-crew reduction is significant over the entire life cycle cost of the ship. Almost 60 percent of all operating costs incurred are due to crew maintenance, including 25 percent of operating costs going to pay alone. By saving the forty-six total billets alone, each ship would save approximately $2 million per year. With twenty-seven ships realizing these savings, the Navy could save $1.4 billion over the life of the ship class (U.S. Navy Chief of Information 1999, 8). Further savings can be achieved without adding more technology, rather changing policies. The Navy has started an initiative to reduce crew size by implementing the Smartship watch rotation

and moving administrative shipboard duties to shore support personnel. USS *Monterey*, USS *Mobile Bay*, USS *Milius* and USS *Mahan* are all preparing for upcoming deployments with this smaller, "optimally manned" crew. As an example, the *Mobile Bay* has already reduced her crew from 342 to 287 (Brown 2000, 18).

These manpower savings are just the start. The program executive officer for surface combatants, who owns the program manager for the DD (X) program, has already said that automation of shipboard operations, combat, logistics and damage control will bring the crew to a level of ninety-five personnel (Program Executive Officer (PEO) Surface Strike 2001, 1). Although a formal breakdown of the actual manning requirements has not yet been released, it is relatively easy to speculate on the crew's makeup using the Smartship technology model.

The number of sailors authorized for each ship class is contained in the *Ship Manning Document* (*SMD*). The *SMD* is based on the Required Operational Capabilities/Project Operating Environments (ROC/POE) for that ship. ROCs are functions a ship is designed to execute, while the POE defines the most demanding environment a ship should expect to perform these functions in. In short, the number of sailors put on a ship is directly proportional to the tasks that ship will be expected to perform.

Generally the Required Operational Capabilities/Projected Operating Environments are generated from the ship class ORD, and then the SMD follows. However, in this case, the number of personnel on the DD (X) family was set in the ORD. By still using the task based premise for personnel assignments, we can determine what tasks those ninety-five will perform by functional area:

Officers: Commanding officer, executive officer, operations officer, combat systems officer, engineer, supply officer, and one junior officer in each of the four departments. This gives a total of ten. Ships today generally have a wardroom equal to one-tenth the crew, so this assumption seems valid (Cordle 2001, 59).

Chief Petty Officers : Chief Petty Officers are the senior enlisted personnel, bringing both leadership skills and technical expertise. With a minimally manned crew, these skills will be relied upon heavily. DD (X) will likely have an equal amount of Chief Petty Officers as junior officers. This brings the total to eighteen.

Ship Control: Smartship serves as an excellent example of how to minimize in the ship control domain. Most ship's bridges underway will have eleven watchstanders: officer of the deck, conning officer, helmsman, lee helmsman, quartermaster of the watch, signalman, boatswain mate of the watch, lookouts (2), messenger, and a radar operator. Smartship watchstanding combines many of these functions into one position. The officer of the deck will maintain the deck, the conn, radar watch, and communications. The quartermaster will keep the navigation plot, the signals watch, the helm and lee helm, boatswainmate responsibilities, and aid in looking out. Coast Guard rules require an after lookout, the third ship control watchstanders. Assuming the officer of the deck is an officer or Chief Petty Officer and assuming there are three watch sections, the total is now twenty-four.

Engineering: Again we can rely on the Smartship model. With automated engineering controls, only four watchstanders are required: an engineering officer of the watch (EOOW), an assistant EOOW (AEOOW), a propulsion system monitor (PSM), and an auxiliary system monitor (ASM). The EOOW and AEOOW will perform all

propulsion and electric plant control functions from a centrally located station, while the system monitors will be free to roam the plant, taking required readings and responding to any emergent situations. Assuming the Engineering Officer of the Watch will be an officer or Chief Petty Officer, and assuming three watch sections, the total is now thirty-three.

Combat Operations: Again relying on the Smartship watchstation model, combat functions can be reduced from the normal Aegis Cruiser twenty-two personnel to nine. These would include a tactical action officer, an air operations supervisor, a surface operations supervisor, a subsurface operations supervisor, electronic support measures supervisor, gun operator, missile system supervisor, two support personnel, and one supervisor (Cordle 2001, 60). Assuming the tactical action officer has already been accounted for, the total is now sixty.

Communication: Maintaining communications, both internally and externally, will require a supervisor, an operator, and a technician. This also takes into account the recent transformation of Navy enlisted rates, in which radiomen transformed into information systems technicians, so the communicators will also maintain all onboard computer hardware and software (Cordle 2001, 60). The total is now sixty-nine.

Damage Control: The heroes of the *Cole*, who salvaged their sinking ship, again reinforce the importance of damage control. The importance of damage control cannot be overstated, especially with so few crewmembers. The damage control organization would be comprised of traditional damage control men and hull technicians, as well as electronic and electrical repairmen. They would be the nucleus of the rapid reaction

squads whose members are the first to report as emergency response (Cordle 2001, 61). Allowing for four specialists, the total is seventy-three.

Supply Support: Supply specialists will still be needed for supply accounting, ordering, tracking, storing, and distributing. Crew care, such as feeding and laundry, must be taken care of by each individual using new available technology. Supply support will consist of four, bringing the total to seventy-seven.

Air detachment: Since the ship specifications call for an air detachment, and the surface community has no control over the size of an air capable detachment, we will stay with the number of twenty-two currently in use (Cordle 2001, 59). This brings the total to slightly over ninety-five.

Of the seventy-seven members of the permanent ship's force, less than one-half from rates traditionally involved in weapons handling and ship's security forces. While the reduced crew size certainly adds to the huge manpower cost saving, this will indeed make the force protection task far more difficult to successfully execute.

Summary

A ship's CO is ultimately responsible for everything that happens on or to his ship. The DoD sponsored commission attempted to ease the CO's job by highlighting force protection areas that need improvement. The first area under scrutiny is intelligence. The commission recommended a greater focus on applying human intelligence and signals intelligence against the newer, smaller terrorist threat. The Navy has redirected its focus on supplying that new intelligence information to ships more rapidly via the blue dart warning system.

Another area that has received a great deal of attention from the Navy is security augmentation forces. The Navy has funded Coast Guard PSUs to augment the security forces of deployed units in foreign ports. These PSUs are rapidly deployable, 117 person units that provide layered defense against both waterborne and land-based threats.

Concurrently, the Navy has pressed ahead with the DD (X) family of surface combatants. Like the Smartships of today, DD (X) will leverage technological advances and watchstanding innovations, allowing a crew of ninety-five to safely and efficiently operate the ship in a wartime environment. Yet with surface combatants of today having difficulty in dealing with force protection, how will minimally manned ships perform this manpower intensive task? Chapter 3 will describe the methodology used to determine a method to define and execute this most important task.

CHAPTER 3

RESEARCH METHODOLOGY

There is no simple right way to do content analysis.

Robert Philip Weber

As demonstrated in the literature review, a great deal of recent work is available regarding the maritime terrorist threat and force protection. Now a proven methodology must be used to sift through this large extant of raw data and put it into a usable form for answering the primary research question. The methodology that will be most useful for this project is content analysis.

Content analysis is a method used to break a collection of works into smaller, relevant, usable pieces of data. A coding scheme is developed to group these data pieces and categorize them by similar ideas or meanings. These groups provide manageable packages of data that can then be used by the researcher to draw final inferences or conclusions from the data (Weber 1990, 5-12).

The first step in creating the coding scheme for the analysis process is to define the recording units (Weber 1990, 22). The recorded units can vary, whether it is as small as a single word in the text, or as large as a common theme running throughout several texts. In attempting to answer the primary research question, providing credible force protection for future, minimally manned ships, the large unit of a common force protection theme will be used. Navy doctrine, Coast Guard doctrine, and professional journals will be reviewed for this theme.

The second step of the analysis process is defining the categories to be used in the project (Weber 1990, 23). The categories the research requires are determined by

looking back again to the primary question. To fully answer the question, at least one method of providing future force protection must be introduced. In turn, that one proposed solution must meet three criteria. It must be credible, it must be performed by or for a ship that is minimally manned, and it will be for future ships that may have additional technologies to ease the watchstanding burdens.

For the solution to be credible, it must allow for the accomplishment of all force protection tasks. Therefore, the first research category that will be used is force protection tasks. Navy doctrine, Coast Guard doctrine, and professional journals will be reviewed to develop an exhaustive list of force protection tasks that experts regard as essential for the safety of ships. These tasks will be kept at the unclassified level.

Next, minimally manned ships must perform these tasks. Therefore, manning will be the second project category. The same written works used to develop the task list will be reviewed for requirements and recommendations on the number of personnel needed to adequately perform each task. Next, port security unit (PSU) manning levels and watchbills will be reviewed. Since PSUs as a whole are considered force protection experts and since they are used to provide force protection for deployed ships, their manning requirements will be considered the optimal level. Finally, ships using current minimal manning levels will be examined through after-action reports and interviews. Ships are required to submit after action reports on each port visit they complete. These reports follow a mandatory format, with one paragraph intended to cover force protection issues. If there are current manning issues, they will be discussed there. Further, their watchbills, obtained through interviews of ship executive officers, force protection

officers, and watchbill coordinators, will show what watch-standing positions can be filled today and what tasks they can accomplish.

There are two additional research categories that are both further subsets of the manning criteria and related to future ship construction. The first is training requirements. Training is clearly related to the manning issue, because personnel performing security tasks must meet certain training requirements. It is related to the future, minimally manned ships because with the lower manning levels, ships will not be able to afford to send crew members away to schools. Whereas ships today can afford to send up to 10 percent of the crew off to schools because of personnel redundancy, with a minimally manned crew each crewmember will have designated duties that he or she is expected to accomplish. There will be little or no redundancy, therefore the crew must arrive at the ship able to perform and must remain on the ship until relieved by a fully trained replacement.

The final research category will be costs. This category relates to manning and future ships. Cost relates to manning in that up to 60 percent of a ship's life cycle cost is due to manning, whether it is pay, benefits, or quality of life expenditures. Training also incurs a small portion of the ship's annual operating budget. It relates to future ship design in that the reason for developing a minimally manned ship, namely the DD (X) family of combatants, was to decrease life cycle costs, making the ship more affordable. Therefore, in devising a viable force protection solution, it must also be cost effective, truly saving the money over the life cycle of a ship.

In determining cost effectiveness, a comparison will be made between the cost of a sailor on a ship and the cost of deploying a sailor as a part of a PSU. The cost of an

individual on a ship will be determined by using the Department of the Navy's Office of Research, Development, and Acquisition's approved "Cost of a Sailor" program, developed by the Navy Center for Cost Analysis. This program calculates both the direct costs incurred, such as pay, allowances and retirement accrual, and indirect pay, such as medical benefits, family medical coverage, and basic training for each pay grade. Added to these basic sailor costs will be training costs incurred, based on interview responses regarding training requirements from ships and PSUs. Since the DD (X) *Operational Requirements Document* (*ORD*) called for a manning level between 95 and 150, and the "typical" crew outlined in chapter 2 assumed a crew of 95, it is imperative to create a cost comparison to determine a final force protection recommendation, because it may be cheaper and more effective to add twenty billets to a future combatant than to continuously deploy augmentation forces.

Technologies will also be investigated, through research and interviews with advanced technologies proponents. Although advanced technologies are heralded as great manpower and cost savers, there is only a great deal of speculation, and little proof, as to their effectiveness. Therefore, due to the long procurement timelines and the uncertainty of future benefits, only technologies that exist now will be considered. These advances will also not be used to diminish the number of personnel designated to accomplish each task unless already proven successful in either government-sponsored developmental or operational testing.

Summary

Content analysis is a method used to review literature, breaking down the large amount of information into smaller themes of related, usable data. Table 3 visually

represents how content analysis will be used in this project. Navy doctrine, Coast Guard doctrine and professional journals will be reviewed in order to develop a comprehensive list of tasks that must be accomplished to provide credible force protection. Next, the same documents will be used to determine either a required or recommended number of personnel needed to accomplish those tasks. To validate or revise the doctrinally derived manning requirements, interviews with Coast Guard and Navy personnel will be conducted, and their watchbills and training pipelines will be reviewed, to determine the amount of personnel actually used today to perform the required tasks. Using the Navy's accepting cost analysis tool, the costs for the required manning levels will be generated. Added to that cost will be the cost of training the ship's self-defense force (SSDF).

This comparison will determine whether it is more feasible to add to the ninety-five proposed billets for the DD (X) family of ships or to deploy security augmentation teams wherever future combatants may make port calls. The delineation of tasks, manning recommendations, training review and cost comparisons in chapter 4 will culminate in one viable, recommended solution to the primary research question in chapter 5.

Table 3. Content Analysis

TASKS	MANNING		EQUIPMENT
DOCTRINAL (Navy)	DOCTRINAL	PEOPLE	Commercially available maritime security tools
		TRAINING	
		COSTS	
	OPTIMAL (PSU)	PEOPLE	
		TRAINING	
		COSTS	
	Ships today	PEOPLE	
		TRAINING	
		COSTS	
DOCTRINAL (USCG)	DOCTRINAL	PEOPLE	
		TRAINING	
		COSTS	
	OPTIMAL (PSU)	PEOPLE	
		TRAINING	
		COSTS	
	Ships today	PEOPLE	
		TRAINING	
		COSTS	
Journals	DOCTRINAL	PEOPLE	
		TRAINING	
		COSTS	
	OPTIMAL (PSU)	PEOPLE	
		TRAINING	
		COSTS	
	Ships today	PEOPLE	
		TRAINING	
		COSTS	

CHAPTER 4

ANALYSIS

> The only real security that a man can have in this world is a reserve of knowledge, experience and ability**.**
>
> Henry Ford

Chapter 1 introduced the primary research question regarding force protection for future, minimally manned surface combatants. It then went on to outline the threat experienced in today's operational environment. Chapter 2 reviewed lessons learned from the *Cole* incident and introduced Coast Guard Port Security Units (PSUs) and the DD (X) program. Chapter 3 laid out the foundation for this analysis. First, force protection tasks will be presented. Next, current Smartship and PSU manning, training, and costs will be discussed. All of these issues will be discussed in regards to their impact on fulfilling force protection tasks. Finally, using the DD (X) manning proposal introduced in chapter 2, the future surface combatant's possible manning, training, and costs for force protection will be examined.

Tasks

A ship is in an extremely unique environment when it is inport. A ship is a war-fighting machine, made to fight a maneuver war at sea. In port, it cannot maneuver to avoid threats or to bring its weapons to bear against threats. Its sensor systems are diminished by the sea-land interface. Its radars, optimized for use in the vast openness at sea, are overloaded by the returns from land and false contacts generated by small debris in the air. Likewise, its sonar systems fall prey to the sound reverberations caused by the

piers and the shallow water. Its missiles are useless against the short-range threats likely to be encountered.

Still, its crew must be prepared to face threats from all different directions, in all different mediums. While inport, the ship is similar to a building, vulnerable to attacks from the shore, including anything from small arms fire to car bomb attacks. Yet it is still afloat, relying on, and vulnerable to, small surface craft. As seen by the USS *Cole* attack, the ship inport will still require waterborne services, such as bulk fuel and water delivery. This makes the ship vulnerable to similar small boat attacks, as well as attacks from more conventional small patrol craft. As discussed in chapter 1, diving technology, including rebreather equipment, is readily available to anyone with appropriate funding. This makes the ship vulnerable to subsurface attacks. Finally, since radar performance is degraded, the ship is more vulnerable than ever to an air attack. In fact, according to Captain R. Lippert, the current Chief of Naval Operations staff, force protection branch head (OPNAV N34A), a ship is most vulnerable when alone in port (Lippert 2002).

In order to discuss sufficient levels of force protection, a comprehensive, standardized task list must be adopted. It must be comprehensive, covering all of the various methods and approaches would-be attackers could take. It must be standardized, so that all ships are aware of the scope of the threat and the required responses to mitigate that threat. The Navy, in fact, provides a standardized set of tasks for all commands to incorporate. The list, enclosed as appendix A, is developed by OPNAV N34A and promulgated in the Naval Criminal Investigative Service's *AT/FP for Naval Operations Commander's Guide.* This text is a primary text for at the Atlantic Fleet Anti-Terrorism Officer Course, while the force protection officers (FPOs) from both USS *Yorktown* and

USS *Mobile Bay* cited it as a definitive source for determining required tasks at different THREATCON levels (Bouldin 2001; Abbott, 2002). Further, the Surface Warfare Development Group and the Navy Doctrine Command use this same list in determining tactics to counter potential threats.

The exhaustive task list can be broken down in two ways. The first way, as presented in the *Commander's Guide*, is to arrange the tasks into sets, which list appropriate measures for the four separate THREATCON levels. (The name THREATCON level is gradually being replaced by the term Force Protection Condition (FPCON).) As the THREATCON level increases, the scope of force protection tasks increases, building upon the earlier set. This way, as the threat increases, so to does the unit's vigilance and situational awareness. For example, the task set for THREATCON Bravo recommends posting additional watches, at the commanding officer's (CO) discretion. This important phrasing reveals that although the CO must ensure increased awareness, he is still the final authority on the scene, retaining command of his crew and ensuring their organization is optimized for the mission at hand. Likewise, in THREATCON Charlie, the task to station the ship's self defense force (SSDF) is given. No set task organization for the SSDF is made here, in the Secretary of the Navy's Instruction 5530.4C, which mandates the uses of an SSDF, or any other lower instruction or warfare publication. This is merely to ensure that as the threat continues to rise, more attention, as deemed necessary by the CO, is given to the threat. Finally, in THREATCON Charlie, ships are made aware of the option of requesting security augmentation forces through the fleet commander in chief.

Although this grouping method is convenient for implementing appropriate measures at each threat condition level, grouping the tasks by warfare area provides a better sense of the number of people required to perform the force protection mission. In the area of general situational awareness, the FPO and his assistants have several tasks that they must complete themselves. First, they must complete the seven supplemental tasks listed in appendix A, preparing the ship for entering port. These tasks include drafting the ship's security plan for the import period, aiding the CO and XO in determining the ship's liberty policy, and briefing the crew about the possible threat awaiting them. This brief includes a rules of engagement (ROE) review for the watchstanders, as well as a review of safety precautions ashore for the liberty parties. Even while not in a duty status, each sailor is reminded that his awareness of inquisitive strangers, abandoned cars or packages, and local gossip may help prevent a serious attack. A small group can complete this set of supplemental tasks even before the ship arrives in port.

Perhaps the most difficult area to provide force protection is ashore. The amount of tasks is small, but is the most equipment and manpower intensive. First, the ship must erect barriers, between 100 feet to 400 feet away from the ship to prevent unwanted traffic approaching. This in itself presents several issues. The ship cannot physically carry that much barrier material, so it is dependent on the host nation to provide the barriers. Since many port visits involve the use of commercial piers, many host nations may be reluctant to cordon off such a vast expanse of expensive pier spacing. The ship must rely on the local defense attaché to resolve such conflicts. Adequate lighting is also required. This, too, is beyond a ship's capabilities, and the local authorities must decide

on an agreeable resolution. Next, the ship must provide armed sentries capable of securing any access points and searching all vehicles, baggage, or persons. While arming the sentries may violate local status of forces agreements, and therefore local law enforcement or military officials will provide an armed presence, it is still the ship's responsibility to provide enough trained personnel to perform any searches.

The seaward approaches offer similar challenges. Effective afloat barriers are also too large to carry on a surface combatant. Therefore, the ship must enact other measures to keep unwanted craft from approaching. These measures would include keeping a small, armed boat in the water at all times. If used efficiently, this small boat crew could patrol the seaward approaches and also query and inspect approaching workboats, illuminate the seaward side with floodlights, and inspect underneath the pier itself. This is a perfect illustration of a small group of sailors effectively performing a variety of force protection tasks simultaneously.

The air approaches may also be difficult to secure without host-nation support. Radar limitations in the sea and land interface have been discussed, but local airspace control authorities may not even allow certain radar emissions due to possible interference with ground based aircraft control radars, commercial IFF equipment, and microwave communication sites. If any radiation restrictions apply, the ship again finds itself depending on host-nation support. Other key tasks are not as difficult, yet are manpower intensive, such as obstructing the flight deck and maintaining a visual air watch.

The subsurface threat is likely the hardest to detect, yet the easiest to thwart. While a subsurface threat may be concealed, it is highly vulnerable to the available

countermeasures. The ship can effectively thwart a diver attack by activating its sonar or Fathometer, while also cycling its propellers, rudders, and seawater suctions. While activating the sonar systems would require only one person on watch, the cycling of engineering equipment are evolutions that would require several watchstanders.

Altogether, there are sixty-four primary tasks to complete when providing force protection for afloat units. There are an additional seven tasks the ship must complete in preparation for arrival. Also listed in appendix A are three supplemental tasks for a PSU initially setting up its operation. These tasks will be discussed later. The tasks can be grouped together to determine the level of protection required for a given threat condition, or they can be grouped by functional area to facilitate determining the number of watchstanders required.

Ships Today

Now that a comprehensive and standardized list of force protection tasks has been introduced, how the ships of today try to perform them will be considered. There are currently five optimally manned ships in the fleet. The discussion will focus on how two of them are manned, organized, and trained for the force protection mission.

The USS *Yorktown* was the Navy's prototype Smartship, undergoing modification in 1996. The official ship's manning document (SMD) is contained in appendix B, which shows a complement of 314 enlisted and 26 officers, for a total crew of 340. This does not include the authorized removal of 44 enlisted and 4 officer billets, bringing the crew total to 292 (Commander, Naval Surface Forces Atlantic 1999, 4). Almost all of the reductions were from the engineering and supply departments. Combat systems and operations departments received a restructured billet list, with the E-8 and E-9 billets

replaced by junior personnel, but maintained end manning strength of ninety-six and eighty-nine, respectively. In discussing tasks, the actual manning figure of 292 will be used, since this is the number ships must use while assigning tasks. While discussing costs, the SMD number will be used, since this is the official number used by the Navy for planning and budgeting.

The first step in providing inport force protection is dividing the crew into an equal number of duty sections. Prior to 11 September, *Yorktown* and *Mobile Bay* were leading the way for the surface fleet, placing their crews in ten-section duty. Through innovative watchstanding reductions, these ships were able to allow their sailors to stand duty less than once a week, while the norm less than a decade ago was once every three days. After 11 September, a greater emphasis Navy-wide was placed on force protection, and many inport watch positions were mandated. The *Yorktown* went into four-section duty (Bouldin 2002), while *Mobile Bay* flexes between ten-section and two-section duty, depending on the declared threat condition (Abbott 2002). Staying in a four-section rotation means each section will have seventy-two or seventy-three people assigned, since the CO, Executive Officer (XO), and two E-9s do not stand duty. Figure B7 shows the watches that the duty section must provide.

The command duty officer (CDO) is in charge of the duty section. He is the CO's representative inport, and he runs the daily ship's routine for the XO. Since these administrative and personnel management tasks can be overwhelming at times, the *Yorktown* has created a duty section FPO billet (Bouldin 2002). This officer, trained by the ship's billeted FPO, ensures force protection duties are expertly executed, trains the

duty section in force protection topics, and provides guidance to the CDO in changing threat conditions.

What personnel does the section leader, who assists the CDO in running the duty section and composes the watchbill, and the FPO have at their disposal to perform force protection? An example of the *Yorktown's* four-section watchbill is in appendix B. Although not listed on this watchbill, engineers would normally be exempt from inport watch routines overseas because they are still running all auxiliary systems inport, including generators for the ship's power. This decreases the amount of available personnel by twelve (three sections of four personnel; engineering officer of the watch (EOOW), assistant EOOW, two Auxiliary Systems monitors). Another two personnel, mess specialists, will not be placed on the watch schedule because they must cook, serve, and clean after each meal for the crew. Accounting for these personnel and the CDO, FPO, and section leader, leaves the duty section with fifty-five personnel. There are five watch periods, four of which are five hours long and one four hours long, encompassing the day. Assuming personnel can stand both the first and last watch, only twelve personnel are needed for traditional inport watches as listed (officer of the deck, technician of the watch, and internal security rover). Force protection requires an additional twenty-one full-time watchstanders. These watches include armed sentries; topside, pier, and bridge rovers; manned M-60 mounts; and full-time, three-person boat patrols. Additionally, there are eight standby watch standers ready to augment the on-watch forces. The Security Alert Team and Back-up Alert Force can be called away at any time by the officer of the deck or CDO. The security alert team is a trained, two-person security team that is required to respond to an incident scene within five minutes.

The backup alert force, a three-man security team, further augments the security alert team, required to be armed and on the scene in ten minutes. Should these forces not be enough, three more personnel, two manning a .50-caliber gun, and one additional M60 gunner, can respond. If these forces are still not enough, the entire duty section not on watch can be armed and employed. The next step would have to be recalling the crew and stationing the SSDF.

Adding up the regular watches, security watches, and other personnel accounted for in other duties, leaves the duty section with only fourteen excess personnel. This is exactly the number required for the inport fire party. This shows that a minimally manned cruiser, in four-section duty, requires every one of those personnel for a specific duty. Innovations are needed to ease the watchstanding burden.

Some innovations were used just to get to the point of breaking even. Based on the *Yorktown* watchbill, it is seen that ships are sharing duties (Taylor 2002). One ship takes responsibility for manning larger caliber guns for all of the ships on the pier. Likewise, a single boat is in the water for all of the ships, allowing some boat crews time to rest and perform maintenance. This is why Captain Lippert said that a ship is most vulnerable while stopping alone in transit--there is no mutual support (Lippert 2002).

The ship can also go into fewer duty sections. Going to three sections would bring in another twenty-four personnel into that section. LTjg R. Abbott, the FPO for the *Mobile Bay*, said that his ship could flex from as many as ten sections down to two sections. This may be an acceptable solution for short periods of time, but crew fatigue, leading to carelessness, can easily result. Another option is recalling part of the crew and stationing the SSDF. According to LTjg K. Bouldin, the *Yorktown's* FPO, their SSDF is

made up of thirty-nine sailors from throughout the crew. They are trained in security and engagement tactics, and normally deploy in three 13-man teams. These teams can be divided up for the duty sections, but fatigue would then quickly set in for the best-trained forces.

Having discussed tasks, manning and watches for ship's today, the next focus is on training. The Navy crews receive two types of training, formal schoolhouse training and on-the-job training. The Navy will soon offer eight force protection related schools. The first, not offered yet, is the AT Level III Commander's Course. It is a two-day course designed to give prospective COs an understanding of force protection fundamentals, defense in depth, tactics and countermeasures, and AT plan development. The next senior level courses are designed for the FPO. The Anti-terrorism Officer course is a five-day course, covering the same topics as the commander's course but with more detail. FPOs also are encouraged to attend the Anti-terrorism Training Officer course, a two-day course which prepares the FPO to conduct effective unit level AT/FP training. The course focuses on seven topics: terrorism operations, detecting terrorist surveillance, individual protective measures, hostage survival, threat levels, force protection condition measures, and weapons of mass destruction (EWTGLANT 2001).

The next sets of courses are aimed at the individuals on the security forces. Force Protection Fundamentals Training, formerly called Shipboard Security Engagement Tactics, is a five-day course that trains the individual how to perform the land- and sea-based force protection tasks. A complementary five-day course, Shipboard Security Engagement Weapons, provides proficiency in all of the weapons used by the Navy. It teaches proper use and maintenance of handguns, shoulder-fired, and other supporting

weapons. These two courses are the most commonly used classes for force protection. Both the *Yorktown* and *Mobile Bay* responded that they try to have all of their security forces complete these courses of instruction (Bouldin 2002; Abbott 2002).

Two new courses are also being offered for the security forces. The first, Visit, Board, Search, and Seizure, is a class designed to teach a full team proper techniques for safely boarding and inspecting ships while conducting maritime interdiction operations. This class also teaches team building and covering fields of fire, important for providing own ship security. Another new class being offered is the armed sentry course, a ten-day class designed to teach the individual the fundamentals of watch standing and the use of weapons. This class was started in November 2001, so there is little feedback on its usefulness. The last course offered by the Navy for force protection is the small arms instructor course. This course qualifies the individual as a small arms instructor and range master, so his talents can be used to train and qualify shipboard personnel on small-caliber weapons.

In addition to the formal schoolhouse courses, the FPOs and senior enlisted personnel provide on-the-job training (OJT). Both the *Yorktown* and *Mobile Bay* reported they use the same, standardized training list for OJT. The topics include: small arms; ROE; the rules of use of deadly force; self-defense; swimmer attack; ship penetration; aircraft attack; small boat tactics; bomb threat procedures; hostage situations; floating devices; repelling boarders; pier penetrations; visitor control; and suspicious packages (Taylor 2002; Abbott 2002). Both ships report they hold training on one of these topics, with either a formal lecture or a drill, every duty day. Additionally, as discussed in chapter 2, the Chief of Naval Operations has mandated that as a part of the

inter-deployment training cycle, the Afloat Training Group holds training and performs assessments on the ship's security forces during the commander's assessment for readiness and training and the final evaluation period.

It is interesting to note here that both ships made very similar comments on force protection training. When asked what was the biggest obstacle to providing adequate force protection, both ships responded training. LTjg Bouldin commented that training funds were a large issue for the *Yorktown* (Bouldin 2002). Since the ship is in Pascagoula, Mississippi, and all of the courses are taught in Little Creek, Virginia, or San Diego, California, the ship has to pay travel and per diem costs for each sailor it puts through a course. He also commented on the lack of gun range time. Ammunition is made available by Naval Surface Forces Atlantic, but there are few free ranges in the fleet concentration areas. FCCS Taylor and LTjg Abbott commented on the difficulty of providing adequate OJT for the security forces. With little formal schooling themselves, the FPOs are given the daunting task of teaching fundamentals, tactics (Taylor 2002), and abstract notions, such as identifying possible terrorists, to their young security forces (Abbott 2002).

Similarly, when asked what is the greatest asset they have been given for providing adequate force protection, every reply was the same. The most important asset is motivated, trained sailors.

The last issue to discuss for current ships is cost. As mentioned in chapter 3, this analysis will use the Navy's approved "Cost of A Sailor" study. The developed direct and indirect costs for each individual were assembled into a computer database program called COMET (Cost of Manpower Estimating Tool) by the Navy Center for Cost

Analysis. A SMD can either be inserted into the COMET program, as was done with the *Yorktown*, or can be developed by the user in the program (as will be seen later with the PSU and DD (X)). For each individual, based on pay grade and rate, the following direct and indirect costs were taken into account.

Table 4. Individual Direct and Indirect Costs

Direct	**Indirect**
Pay	Averaged recruiting costs
BAQ	Rating weighted training costs
BAS	Average DoD health care
Average VHA value	Average GI Bill
Reenlistment Bonuses (average by pay grade)	
Default PCS move value	
Sea pay	
Flight deck pay (for 30 individuals)	

As seen in appendix B, the total cost for the *Yorktown* manning in one year, using current year 2000 dollars, is $13,635,167 for enlisted, $3,320,613 for officers, giving a grand total of $16,955,781. This total will be compared against the PSU and DD (X) totals later.

Port Security Units

Next, PSUs will be examined in the same manner as today's Smartships. Since tasks have been reviewed, only a cursory glance will be made at tasks. Then manning, training, and costs will be discussed.

PSUs are capable of performing all of the tasks in appendix A. They may be deployed with a Navy Mobile Inshore Underwater Unit (MIUWU) or alone, as they were in their maiden Middle Eastern deployments. If deployed with the MIUWU, the

MIUWU will establish a Harbor Defense Command Unit (HDCU), responsible for proving command, control, and communications between all security forces. This HDCU is the hub for data collection and dissemination between the security forces, the senior officer of the port facility, and the ships (Commandant Instruction M3501.53A, 8). If acting as the sole security force for a facility, the PSU will accomplish the same prearrival tasks as the ships' FPOs as well as the three supplemental PSU tasks of providing the command, control and communications. Once the ships arrive, it is important to note that the ship is still responsible to provide an adequate level of force protection, as deemed prudent by the CO. The PSU is a professional force, which augments the ship's force. Also interesting to note is that once a PSU deploys as a full unit to provide port security, they will remain at that port facility. Lieutenant Commander Robert Grassino, XO of PSU 308, contends that the PSUs are not able to send a smaller detachment to provide security augmentation for a single ship in a separate, distant facility (Grassino 2002).

Appendix C illustrates the makeup of a PSU. The manning information is based on PSU 305, which was activated under a presidential selective reserve call-up in January 2002. They have deployed with 117 enlisted and 13 officers. Under low threat levels, the PSU is organized into three watch sections. Each section is led by a CDO, who has a transportable port security boat (TPSB) tactical action officer overseeing the seaward defensive positions and a security platoon leader overseeing the shore security positions. The TPSB tactical action officer has four boat crews on watch, providing layered security as shown in figure 1. Each Security Platoon Leader has a security team of six individuals on shore watch. The CDO also has an engineering support team standing by to provide

area damage control. Area damage control is defined as providing repair to material casualties that would hamper the unit's ability to perform the primary security mission (Commandant Instruction 1994, 22). The units have ample supplies to repair any damage incurred by organic equipment, but little capabilities to repair any preexisting structures.

Just as Navy ships have contingencies to add extra watchstanders during increased threat levels, the PSU will add watchstanders by decreasing the number of watch sections. In times of increased threat levels for extended periods, the PSU will drop to a two-section watch. An operations center is created, with the unit CO or XO present at all times to run the watch organization. Six TPSB crews are on station, providing extra coverage for the seaward approaches. Three fire teams provide the shoreside security, each team with four personnel. This effectively doubles the amount of watchstanders on duty at any given time from the three-section rotation. The engineering support teams providing area damage control are also effectively doubled.

For shorter duration threats, the PSU can go into its highest state of readiness, general quarters. The operations center is fully manned by the CO and his administrative staff. All six boats are patrolling. Three eight-man security teams are providing defensive positions ashore, augmented by three additional security teams. These security teams are, in turn, made up of two 4-man fire teams. All engineer support personnel are available to provide area damage control. All of the PSU personnel are armed and prepared to face incoming threats, including the food specialists, who are armed with M-16s.

Just as there are similarities between the Navy and the Coast Guard in watchstanding philosophies, many similarities in the security personnel training pipelines

exist. Appendix C contains a listing of all Coast Guard formal force protection schools available. These schools are mandatory for PSU personnel, whereas the Navy only recommends that its personnel attend. This stems from the fact that for Coast Guard personnel, the security mission is the primary mission. For the Navy sailors, the security mission is a collateral duty.

How similar are the pipelines? Table 5 presents a listing of the services' formal schools. The PSU security officer, the equivalent of the Navy FPO, attends the identical courses as his Navy counterpart. PSU security team members attend the two-week Phoenix Readiness course. This course is similar to a combination of the Navy's Shipboard Security Engagement and Weapons and Force Protection Fundamentals Training courses, providing a familiarization of joint security doctrine, heavy weapons familiarization, offensive and defensive perimeter security tactics, and day-night team movements training. The Coast Guard sailors also attend Maritime Law Enforcement Boarding Officer/Boarding Team Member courses, which cover the same type of material as the Navy's Visit Board Search and Seizure course. Finally, just as the Navy ships undergo a final force protection assessment during the final evaluation period, the Coast Guard provides its units with a tailored training availability prior to deployment to provide a final assessment.

The Coast Guard also offers its security teams training the Navy does not. A two-week basic skills course is offered to new PSU members. It provides exactly what the title says, basic knowledge on firearms, tactics, the threat, and ROE. The Navy has just begun teaching a similar syllabus with its Armed Sentry Course. Finally, the PSU boat division also receives operational and tactical training with the TPSB Ops and Tactics

Course. Here they learn effective warning, shouldering, and maneuvering to fire position tactics.

Table 5. Comparison of Coast Guard and Navy Force Protection Schools

Coast Guard School	**Navy Equivalent School**
Anti-Terrorism Officer/Anti-Terrorism Training Officer	Anti-Terrorism Officer/Anti-Terrorism Training Officer
PHOENIX Readiness	Force Protection Fundamentals Training Shipboard Security Engagement Weapons
PSU Basic Skills Course	Armed Sentry Course
Maritime Law Enforcement Boarding Officer/Boarding Team Member	Visit Board Search and Seizure
Small Arms Instructor	Small Arms Instructor
Tailored Training Availability	Final Evaluation Period
TPSB Operations and Tactics	

Also similar to the Navy, the Coast Guard puts a heavy emphasis on OJT. Their OJT mirrors the Navy's, with the addition of basic troop tactics. Like the Navy, all personnel train and are qualified in their positions using Personnel Qualification Standards (PQS). Watchstation PQS consists of a set of basic fundamentals and systems questions, as well as task demonstrations, that an individual must answer or perform to a senior, qualified individual before he is allowed to stand the watch.

With so many similarities between the two maritime services, are there any significant differences? Actually, there are very few according to Lieutenant Commander Lee Hanford, executive officer of PSU 305. The primary differences are in the Coast Guard's interpretation of arming orders and ROE, which seems more liberal than the Navy's. These differences are easily overcome, states Lieutenant Commander Hanford, by creating early open dialogue on any such questions. He also states that as the two

services work together more, the differences are becoming less apparent and such misunderstandings have occurred less and less (Hanford 2002). Finally, the same question that was posed to the Navy FPOs, what is the greatest asset available to perform you jobs, was given to PSU officers. Again, a similar answer was given. Both Lieutenant Commanders Hanford and Grassino replied, "Highly trained individuals."

In reviewing costs, appendix C has two separate sets of data. One, supplied by LTjg Cheryl Honeycutt, the Coast Guard Atlantic Area PSU Coordinator, reflects the estimated personnel and equipment costs for a PSU deployment. Since these personnel costs do not reflect all direct and indirect costs the Navy COMET program takes into account, a separate COMET database is also provided. This crew is made up of Navy rate equivalents, such as Navy master at arms replacing Coast Guard physical security specialist. Although average training costs between the two will differ in reality, it still provides a more reasonable comparison. The equipment costs are shown for information only. While this specialized equipment is necessary and represents a valid cost to take into account, the Navy force protection equipage list is not available in open sources, so no true equipment cost can be generated for comparison.

It is interesting to note the large expenditure for fuel. Fuel is required for generators to provide power to the operations center and tent city, the six TPSBs, and the vehicles needed to move personnel and equipment around the extended perimeter. This is not only a large expense, one-quarter of a million dollars for six months, but it requires a logistical line to provide the fuel in a timely manner.

Finally, appendix C lists the total cost for PSU manning in one year, using the COMET model. Using current year 2000 dollars, the total is $9,272,121 for enlisted,

$1,791,917 for officers, giving a grand total of $11,064,037. Again, the PSU SMD was built using PSU 305 manning levels and Navy equivalent ratings. The true level of direct and indirect costs may differ. However, when trying to determine if the possible solution to the primary research question is to create a Navy unit based on the PSU model in order to provide force protection, this model seems most acceptable. This total dollar figure will be compared against the Smartship and DD (X) totals later.

DD (X)

The crew of DD (X) will face the same challenges as the Smartship crews of today, only with fewer personnel. In fact, using the proposed manning introduced in chapter 2, the crew of DD (X) would have less than a Smartship duty section. This manning proposal is presented in appendix D. The aviation detachment, since normally onboard only for workups and deployment, is not accounted for in this proposed SMD. This leaves a total of sixty-seven enlisted and ten officers on board. Assuming that several ships of the class always steam together, thus allowing for shared defenses, the most the crew would be able to manage is two-section duty, which would quickly lead to fatigue.

To arrive at these figures, again a look to the Smartship model is made. A CDO and a section leader will head the duty section. Twenty-one full-time security personnel are required (four sections of four armed rovers, three person boat patrols, two M-60s), as well as eight reserve personnel (SAT/BAF/50 cal). Assuming technological advances (briefly discussed later) do indeed help situational awareness for the Officer of the Deck and his three-person watch team, the Navy can make them stand more watches in a day, requiring only two sections each duty day (another six personnel). Assuming the same

improvements for engineering, the Navy can reduce the manning required to four, or two sections of two personnel. No mess support will be needed. This manning proposal allows for duty sections of thirty-three enlisted, four officer, with the CO, XO, and command master chief not on the watchbill.

Technology does not appear to be a force protection solution. In May 2001, the Navy's Science and Technology Corporate Board approved research in twelve future capability categories. These categories are:

1. Autonomous Operations, including heavy reliance on unmanned vehicles
2. Capable Manpower, stressing improvements to Human-System Interfaces
3. Electric warships and combat vehicles
4. Knowledge superiority, stressing network centric warfare
5. Littoral ASW improvements
6. Littoral combat and power projection improvements
7. Missile Defense
8. Organic mine countermeasures
9. Time critical strike warfare systems
10. Life cycle cost reductions
11. War fighter protection, stressing improvements to medical services
12. Platform protection, stressing weapons, sensors, stealth, countermeasures, and damage control (Office of Naval Research 2002, 2)

If there are any future technologies related to physical security, they are related to the final field, platform protection. However, Mr. John Petrik from the Corporate Staff of the Office of Naval Research indicates there is no information on planned technologies

for force protection ready for release now (Petrik 2002). Force protection is now and for the near future will continue to be a manpower-intensive task.

Training is also an area of concern for DD (X). With such a small crew, it would be impossible to part with any crewmembers for even a short period of time. Ships today generally allow up to 10 percent of the crew to be away from the ship, either at school or on leave. DD (X) would not have that luxury. Therefore, even though training requirements will not change, the method of providing the training will have to. Sailors must arrive at the ship having already completed all of the formal training they will require, allowing them to immediately fulfill their assigned duties upon arrival.

One way to approach easing the DD (X) force protection problem is by adding to the assumed number. The crew initially proposed is only based on professional journal articles, attempting to stay close to the low end of the Operational Requirements Document (ORD) manning requirement of ninety-five. The ORD requirement for manning is 95 to 150. Therefore, a second SMD is proposed in appendix D, called DD (X) Plus. This SMD adds a total of thirty-three force protection specialists. They can provide three teams of eleven security personnel to provide force protection area security in high threat environments or can be divided into two teams to augment the duty section. These two additional security teams would provide the nucleus of the required twenty-one-man security force seen on today's ships. That would preclude forcing other watchstanders to stand twelve hours of watch per day, which would seriously decrease their watch standing performance. Additionally, these teams can be detachments, much like the helicopter detachments, serving with the ship only during workups and

deployments. In between deployments, they can receive additional training and serve as part of the security detachment for naval bases.

One of the driving reasons for the introduction of new technologies to reduce crew size is the reduction in total life cycle costs. Based on this DD (X) model the following costs are: DD (X) enlisted, $5,842,814; DD (X) officer, $1,376,439; DD (X) total, $7,219,253; DD (X) Plus enlisted, $7,839,328; DD (X) Plus officer, no change; DD (X) Plus total, $9,215,768. Now a comparison of the key points of each unit and the associated costs will be made.

Summary

Table 6 gives a visual comparison of manning, training and costs. Overall, there are sixty-four tasks to perform in order to provide adequate force protection for a naval vessel inport. These tasks can be grouped by set for implementation in varying threat condition levels, or by warfare area to determine overall numbers of manning required. In order to perform these tasks, Navy leadership requires well-trained sailors. The training comes from eight Navy or Coast Guard formal schools, and standardized OJT.

Table 6. Summary of the Various Unit Manning Levels, Costs, and Training

UNIT	MANNING		COSTS	TRAINING
SMARTSHIP	270	22	16,955,781	School/OJT
PSU	117	13	11,064,037	School/OJT
DD (X)	67	10	7,219,253	School/OJT
DD (X) Plus	100	10	9,215,768	School/OJT

Smartships can go to four-section duty, using the following model to provide force protection inport:

1. Four sections of four, armed rovers (16 personnel)

2. One boat crew (three personnel, also assumes mutual defense with other ships to provide extra sections)

3. Two M-60 qualified personnel (also assumes mutual defense)

4. Eight reserve security forces on call (SAT/BAF/.50-caliber)

With mutual support, Smartships can perform this role for an extended period of time. When inport alone, the ships are at their most vulnerable.

Supplying 117 trained security force personnel and heavy equipment, such as barriers, to provide area force protection, PSUs can be used to augment these forces. They bring the necessary expertise to deal with any situation in a high threat region. Because of their maritime heritage and previous experience in working with Naval forces, they transition and work well with afloat units. Based on the threat condition level, PSU watch rotation varies between one and three section duties, which they can support for six-month periods. The only shortcoming is the inability to detach a smaller squad to provide force protection at another, distant port facility.

DD (X), as presented in this work, will not be capable of performing even short-duration force protection (greater than twenty-four hours) without augmentation. Even with an additional thirty-three-man security force, organic force protection can only be provided for extremely short duration, even with PSU augmentation.

Using the Navy's COMET program, annual manning costs for each unit were generated. These costs take into account the direct and indirect costs for providing sailors. A typical Smartship costs almost $17 million per year to man, while the PSU costs just under $11 million. In today's environment ,where Smartship forces are

augmented by PSUs, that total cost runs to $28 million. By contrast, the DD (X) program costs just over $7 million, while the addition of thirty-three security personnel runs that tally up to $9 million. Adding the costs of the DD (X) Plus with the required PSU security providers, the annual cost will run to $20 million, more than the manning cost of today's Smartship.

With the analysis complete, the next chapter will present the conclusions drawn from this analysis. After doing so, a possible solution to the primary research question will also be provided, while additional recommendations for programs and further research will be proposed.

CHAPTER 5

CONCLUSIONS AND RECOMMENDATIONS

Eternal vigilance is the price of freedom.

Wendell Phillips

Throughout this paper, Navy force protection has been examined in order to determine a method to accomplish that task on future, minimally manned combatants. Past failures have been reviewed, as well as the current and potential threats afloat units must be prepared to face. A methodology to study force protection tasks, manning, training, and costs was introduced. That methodology was the framework of an analysis that revealed the tasks to accomplish, manning available to accomplish the tasks, and the associated costs for today's Smartships, Coast Guard Port Security Units (PSUs), and the possible future DD (X) family of combatants. This chapter will present the conclusions of that analysis.

First and foremost, the true importance of force protection must be understood. As discussed in the literature review, the Crouch-Gehman Commission recommended that force protection be trained as a primary mission area. While this is prudent at the shipboard level, the Navy must bear in mind that force protection is merely an enabler. The Navy's primary mission areas remain unchanged: presence, power projection, and sea control. In engaging foreign powers by displaying a forward presence, ships will, as they always have, occasionally sail into harm's way. Force protection can merely mitigate the risk of harm, never fully alleviate it.

Manning, Costs, and Training

There are several conclusions to make about force protection manning levels for the various units. First, the analysis shows that the current Smartships are capable of providing adequate unit force protection, even when in their most vulnerable condition, alone in a non-Navy controlled port. However, this ability may incur further costs than the direct and indirect manning costs of $17 million per year, as determined in the analysis. The increased demands of being in as few as two or three duty sections, especially while deployed, may reduce sailor retention rates. If more sailors choose to depart the service, the indirect recruiting and training costs raise, as will the direct bonuses that must be offered to retain the highly skilled, professional sailors. The short-term abilities may cost a great deal in the long run.

Similarly, apparent savings in the minimal manning of the DD (X) family of ships may not be as large as anticipated. As demonstrated in the analysis, the DD (X) manning level proposed in this paper, using the Operational Requirements Document (ORD) low end manning of ninety-five, will not provide adequate force protection. One reason for this is anticipated technological advances will not ease the burdens of this manpower intensive mission area. Even with an additional thirty personnel, the ship would only be able to provide force protection for a few days. This would require using only one or two duty sections, so as with the Smartships, one could expect lower retention and higher direct and indirect manning costs over the life of a ship. Further, since the ship is not able to provide its own force protection, a security augmentation force, such as a Coast Guard PSU, would be required for port calls. The combined manning costs for the DD (X) and the PSU is over $18, more than today's Smartship manning costs. In effect,

minimal manning could conceivably cost more, not less, over the ship's life cycle. Granted, this is an overgeneralization, since a PSU would be on station for several months, thus augmenting several crews, allowing the manning costs to spread over several ships. However, it is a concern that must be addressed.

Finally, the PSUs are properly manned for their force protection augmentation role. The PSUs are capable of providing long-term augmentation in all of the possible threat approach areas. Their training is nearly identical to the Navy security force's training, so with minimal prior interaction, the PSUs and the ships can mesh together to provide seamless force protection for deployed units.

Recommendations

The analysis and conclusions led to several recommendations. The first recommendation answers the primary research question regarding providing force protection for the future, minimally manned combatants. The DD (X) family of ships must have a crew at least equal to the DD (X) Plus crew proposed in the analysis, a crew of 132 including the aviation detachment. Discounting the aviation detachment, there would be one hundred enlisted, including thirty enlisted with a force protection specialty, and ten officers. This crew size could support two duty sections. Further, when forward deployed, this crew must be augmented by a PSU-type security force, which can provide protection from both the landward and seaward approaches.

Several other recommendations may be implemented to accomplish this. First, the Navy should again fund Coast Guard PSU deployments in support of the Navy or create a Navy PSU by restructuring the inshore boat units (IBUs). Currently, the IBUs

are considerably smaller and have less force protection specialty training. The PSUs, alone, provide a more in-depth, robust force protection capability.

This PSU structure can also be slightly improved upon. By adding an additional sixteen personnel, or two fire teams, the PSUs may be able to create a small "fly-away" detachment. This detachment may then be able to leave their original deployment area in order to provide a smaller level of support in a different area to a vessel, alone in transit, stopping at a port with no deployed security force.

Training is another area that can be restructured. Since the Navy and Coast Guard have such similar force protection training syllabuses, it may be more cost effective to combine the formal schools for the two services. Rather than running redundant schools in the same geographical areas, the services may be able to consolidate their efforts.

Areas for Further Research

The conclusions and recommendations stated above reveal several areas that need further study. The new family of future combatants itself raises several interesting areas of study. First, since this paper is based on a proposed DD (X) manning document, the topic should be reviewed if the actual manning document, when released, differs significantly from the proposed. Future technologies which may support all primary mission areas can also be explored further. Next, this paper only dealt with minimal manning with regards to force protection. Several studies have been done regarding minimal manning and damage control. The subject of minimum manning and how it affects all other primary mission areas, as well as collateral areas, such as preservation, should be explored and debated.

The arena of force protection has also stirred a great number of debates in professional forums. Many areas require further research, such as the role of rules of engagement (ROE). In today's environment, just what does constitute hostile intent? The different interpretations, and implementations, of ROE by the Coast Guard and the Navy are interesting. Also, as the IBUs finish their maiden deployments, their manning levels, and the tasks they can accomplish, should be investigated.

Finally, the feasibility and possible cost-savings of combining the Navy and Coast Guard force protection expertise should be explored. Perhaps the training curriculum could be combined for greater cost savings. Perhaps the ideal PSU would be a combined USCG/USN team. Possibilities for a closer relationship between the nation's two primary sea services should be investigated.

Summary

John Paul Jones once said, "Give me a fast ship, for I intend to go in harm's way." In his day, the only harm was presented by other ships of the line, at sea. Today, our warships are constantly putting themselves into harm's way. Although 11 September is the day that changed most Americans' lives with regards to the threat from terrorism, the U.S. Navy became intimately aware of the threat and the scope of the problem on 12 October 2000. On that day, the USS *Cole* was attacked by suicide bombers. Although great progress has been made in providing force protection, there is work to be done. In order to maintain the initiative against terrorists, we must continue to provide force protection today while planning for the future force protection. This task is made even more difficult in that future ships will require less manning to operate conventional warfare systems. However, force protection, especially for a ship inport, is a manpower

intensive task that will not be made easier by technology. By addressing the problem today, we can ease the burdens of our commanders and sailors in the future.

APPENDIX A

FORCE PROTECTION TASK LIST

COMBATANT SHIPBOARD THREATCON MEASURES

THREATCON Normal applies when a general threat of possible terrorist activity exists, but warrants only a routine security posture.

THREATCON ALPHA. This condition is declared when a general threat of possible terrorist activity is directed toward installation and personnel, the nature and extent of which is unpredictable, and when circumstances do not justify full implementation of THREATCON BRAVO measures. However, it may be necessary to implement certain selected measures from higher THREATCONS as a result of intelligence received or as a deterrent. The measures in THREATCONS must be capable of being maintained indefinitely.

1. Brief crew on the port specific threat, the security/force protection plan, and security precautions to be taken while ashore. Ensure all hands are knowledgeable of various THREATCON requirements and that they understand their role in implementation of measures.

2. Muster and brief security personnel on the threat and rules of engagement.

3. Review security plans and keep them available. Retain key personnel who may be needed to implement security measures on call.

4. Secure spaces not in use and periodically inspect them.

5. Remind all personnel to be suspicious and inquisitive of strangers, be alert for abandoned parcels or suitcases and for unattended vehicles in the vicinity. Report unusual activities to the OOD.

6. Review pier and shipboard access control procedures.

7. Ensure sentries, roving patrols and the quarterdeck watch have the ability to communicate.

8. Coordinate pier/fleet landing security requirements with senior officer present, afloat (SOPA), collocated forces, and/or local authorities. Identify anticipated needs for mutual support and define methods of activation and communication.

9. When in a non-U.S. Navy controlled port, deploy barriers to keep vehicles away from the ship if possible, consistent with the threat. (100 feet U.S. ports and 400 feet outside U.S. minimum standoff distance)

10. Randomly inspect vehicles entering pier.

11. Randomly inspect hand carried items and packages before they are brought aboard.

12. Regulate shipboard lighting to best meet the threat environment.

13. When in a non-U.S. Government controlled port, rig hawsepipe covers and rat guards on lines, cables and hoses. Consider using an anchor collar.

14. When in a non-U.S. Government controlled port, raise accommodation ladders, stern gates, ladders, etc. when not in use.

15. Increase frequency of security drills.

16. Review individual actions in THREATCON BRAVO for possible implementation.

THREATCON BRAVO. This condition is declared when an increased and more predictable threat of terrorist activity exists. The measures in threat condition must be capable of being maintained for weeks without causing undue hardships, affecting operational capability or aggravating relations with local authorities.

17. Maintain appropriate THREATCON ALPHA measures.

18. Set material condition yoke, main deck and below.

19. Consistent with local rules, regulations, and/or the status of forces agreement, post pier sentries (armed at COs discretion), as necessary.

20. Restrict vehicle access to the pier. Discontinue parking on the pier. Consistent with local rules, regulations, and/or the status of forces agreement, establish unloading zone(s) and move all containers as far away from the ship as possible, consistent with the threat. (100 feet in the U.S., 400 feet outside the U.S. as minimum standoff distance.)

21. Consistent with local rules, regulations, and/or the status of forces agreement, post additional watches (armed at COs discretion), as necessary. If armed, local threat, environment and fields of fire should be considered when selecting weapons.

22. Post signs in local language that clearly define visiting and loitering restrictions.

23. When in a non-U.S. Government controlled port, identify and inspect workboats, ferries and commercially rented liberty craft at least daily on a random basis.

24. When in a non-U.S. Government controlled port, direct liberty boats to make a security tour around the ship upon departing from and arriving at the ship with particular focus on the waterline, and under pilings when berthed at a pier.

25. Inspect all hand carried items, and packages before allowing them aboard. Where available, use baggage scanners and walk through or hand held metal detectors to screen packages and personnel prior to boarding the ship.

26. Implement measures to keep unauthorized craft away from the ship. Authorized craft should be carefully controlled. Coordinate with host nation/local port authority as necessary, and request their assistance in controlling unauthorized craft.

27. Raise accommodation ladders, stern gates, ladders, etc., when not in use. Clear ship of all unnecessary stages, camels, barges, oil donuts, and lines.

28. Review liberty policy in light of the threat and revise it, as necessary, to maintain safety and security of ship and crew.

29. Conduct divisional quarters at foul weather parade.

30. Ensure an up-to-date list of bilingual personnel for area of operations. Maintain warning tape in pilot house/quarterdeck, for use on the ship's announcing system, that warns small craft to remain clear in both the local language and English.

31. If not already armed, arm the quarterdeck watch.

32. If not already armed, arm the sounding and security patrol.

33. Review procedures for expedient issue of firearms and ammunition to the Shipboard Self-Defense Force (SSDF) and other members of the crew, as deemed necessary by the CO.

34. Test internal and external communications. Include connectivity checks with local agencies/authorities that will be expected to provide support, if required.

35. Instruct watches to conduct frequent, random searches of pier to include pilings and access points.

36. Conduct visual inspections of the ships hull and ships boats at intermittent intervals and immediately before it puts to sea.

37. Hoist ships boats aboard when not in use.

38. Terminate all public visits. In U.S. Navy controlled ports hosted visits (family, friends, small groups sponsored by the ship) may continue at the COs discretion.

39. After working hours, reduce entry points to ships interior by securing infrequently used entrances. Safety requirements must be considered.

40. In non-U.S. Government controlled ports, remove one brow if two are rigged.

41. In non-U.S. Government controlled ports, maintain capability to get underway on short notice or as specified by SOPA.

42. In non-U.S. Government controlled ports, consider layout of fire hoses. Brief designated personnel on procedures for repelling boarders, small boats, and ultralight aircraft.

43. Where applicable, obstruct possible helicopter landing areas.

44. Where possible, monitor local communications (ship to ship, TV, radio, police scanners, etc.).

45. Inform local authorities of actions being taken as THREATCON increases.

46. Review individual actions in THREATCON CHARLIE for possible implementation.

THREATCON CHARLIE. This condition is declared when an incident occurs or intelligence is received indicating that some form of terrorist action against installations and personnel is imminent. Implementation of this THREATCON for more than a short period will probably create hardship and affect the peacetime activities of the ship and its personnel.

47. Maintain appropriate THREATCON ALPHA and BRAVO measures.

48. Consider setting material condition zebra, second deck and below.

49. Cancel liberty. Execute emergency recall.

50. Be prepared to get underway on short notice. If conditions warrant, request permission to sortie.

51. Block all vehicle access to the pier.

52. If the threat situation warrants, deploy picket boats to conduct patrols in the immediate vicinity of the ship. Brief boat crews and arm with appropriate weapons considering the threat, the local environment, and fields of fire.

53. Coordinate with host nation/local port authority to establish small boat exclusion zone.

54. Deploy the SSDF to protect command structure and augment posted watches. Station the SSDF in positions that provide 360-degree coverage of the ship.

55. Energize radar and/or sonar, rotate screws and cycle rudder(s) at frequent and irregular intervals, as needed to assist in deterring, detecting or thwarting an attack.

56. Consider manning repair locker(s). Be prepared to man one repair locker on short notice. Ensure adequate lines of communication are established with damage control central.

57. If available and feasible, consider use of airborne assets as an observation/force protection platform.

58. If a threat of swimmer attack exists, activate an antiswimmer watch.

59. In non-U.S. Government controlled ports and if unable to get underway, consider requesting augmentation by the FLTCINC.

60. Review individual actions in THREATCON DELTA for implementation.

THREATCON DELTA. This condition is declared when a terrorist attack has occurred in the immediate area or intelligence has been received that terrorist action against a specific location is likely. Normally this THREATCON is declared as a localized warning.

61. Maintain appropriate THREATCON ALPHA, BRAVO, and CHARLIE measures.

62. Permit only necessary personnel topside.

63. If possible, cancel port visit and get underway.

64. Employ all necessary weaponry to defend against attack.

Supplemental Tasks for FPO.

1. Review NCIS threat assessment, Naval Blue Dart Messages, NAVATAC Spot Reports, NAVATAC daily summaries and any other intelligence information available.

2. Obtain/review other agreements in effect. If necessary, send message to responsible MAAG/Mission or consulate requesting information on following items:
a. Jurisdiction
b. Arming of topside and other watchstanders.
c. Host country emergency support availability and how to contact.

3. Determine if ship will be alongside a shore structure (pier, wharf, or quay) or anchored? (Following information may be included in a port visit request message.)
a. If alongside a shore structure:

(1) Is area U.S. or foreign controlled?
Ascertain jurisdiction and lines of responsibility.
(2) Will pier watches be military, civilian or both? If civilian, will the forces be standard police forces or hired guards?
(3) Determine height of pier. Determine number of camels required and/or other ability to breast out, if brows can support the span.
(4) "Normal" pier traffic expected.
b. If anchored:
(1) Availability of foreign waterborne support (e.g., host Coast Guard and/or naval units).
(2) Review possibility of own-ship picket boat operations. Include:
a. Legal ramifications.
b. Logistics capabilities (suitable boat, boat crew training, etc.)
(3) Normal traffic through the expected anchorage area.
(4) Whether anchorage is in a tidal flow or still water (affects floating bombs, mines and swimmers).

4. Obtain times and strength of tidal changes.

5. Review ship's watchstander qualifications and posting.

6. Review SSDF qualifications and training.

7. Conduct general AT/FP training, include AT awareness specific items in In-port brief.

(The above THREATCON descriptions and task listings are taken from the Naval Criminal Investigative Service's Anti Terrorism/Force Protection for Naval Operations Commander's Guide, p. 11)

Supplemental tasks for shore based security teams.

1. Institute a unit operation center (OPCEN). OPCEN will provide all tactical orders, communications and administrative support to the watchstanders.

2. Provide a layered waterborne point defense within protected waters of harbor, extending out to the sea buoy (if all waters are protected).

3. Provide area damage control to counteract the effects of material casualties to rear area units.

(Supplemental tasks for shore based security units derived from USCG Commandant Instruction M3501.53A, PSU Operational Doctrine.)

APPENDIX B

USS *YORKTOWN* MANNING INFORMATION AND INPORT WATCHBILL

Department	E1-3	E4	E5	E6	E7	E8	E9	Total
CHAPLAIN	0	0	1	0	0	0	0	1
COMBAT SYSTEMS	12	39	22	15	4	3	1	96
ENGINEERING	11	21	13	5	4	1	0	55
EXECUTIVE	1	2	1	3	1	0	1	9
MEDICAL	0	1	0	0	1	0	0	2
OFFICERS	0	0	0	0	0	0	0	0
OPERATIONS	29	19	28	9	4	0	0	89
SUPPLY	27	8	9	6	1	1	0	52
TRAINING	0	0	2	3	3	1	1	10
TOTAL	80	90	76	41	18	6	3	314

Department	O1	O2	O3	O4	O5	O6	Total
CHAPLAIN	0	0	0	0	0	0	0
COMBAT SYSTEMS	0	0	0	0	0	0	0
ENGINEERING	0	0	0	0	0	0	0
EXECUTIVE	0	0	0	0	0	0	0
MEDICAL	0	0	0	0	0	0	0
OFFICERS	5	7	8	5	1	0	26
OPERATIONS	0	0	0	0	0	0	0
SUPPLY	0	0	0	0	0	0	0
TRAINING	0	0	0	0	0	0	0
TOTAL	5	7	8	5	1	0	26

Department	Enlisted	Officer	Total
CHAPLAIN	1	0	1
COMBAT SYSTEMS	96	0	96
ENGINEERING	55	0	55
EXECUTIVE	9	0	9
MEDICAL	2	0	2
OFFICERS	0	26	26
OPERATIONS	89	0	89
SUPPLY	52	0	52
TRAINING	10	0	10
TOTAL	314	26	340

Department	E1-3	E4	E5	E6	E7	E8	E9	Total
CHAPLAIN	0	0	80235	0	0	0	0	80235
COMBAT SYSTEMS	0	1454792	1459801	956741	404917	0	0	4276251
ENGINEERING	0	395921	1547784	382352	334497	115947	0	2776501
EXECUTIVE	67132	0	80456	89555	0	0	0	237143
MEDICAL	0	0	77925	86503	0	0	0	164429
OFFICERS	0	0	0	0	0	0	0	0
OPERATIONS	296051	1512989	1502075	786600	0	0	129705	4227420
SUPPLY	0	221806	412646	181979	0	0	0	816431
TRAINING	0	0	182595	309686	314198	120653	129626	1056758
TOTAL	363182	3585507	5343518	2793416	1053612	236601	259331	13635167

Department	O1	O2	O3	O4	O5	O6	Total
CHAPLAIN	0	0	0	0	0	0	0
COMBAT SYSTEMS	0	0	0	0	0	0	0
ENGINEERING	0	0	0	0	0	0	0
EXECUTIVE	0	0	0	0	0	0	0
MEDICAL	0	0	0	0	0	0	0
OFFICERS	820097	604883	944979	775426	175228	0	3320613
OPERATIONS	0	0	0	0	0	0	0
SUPPLY	0	0	0	0	0	0	0
TRAINING	0	0	0	0	0	0	0
TOTAL	820097	604883	944979	775426	175228	0	3320613

Department	Enlisted	Officer	Total
CHAPLAIN	80235	0	80235
COMBAT SYSTEMS	4276251	0	4276251
ENGINEERING	2776501	0	2776501
EXECUTIVE	237143	0	237143
MEDICAL	164429	0	164429
OFFICERS	0	3320613	3320613
OPERATIONS	4227420	0	4227420
SUPPLY	816431	0	816431
TRAINING	1056758	0	1056758
TOTAL	13635167	3320613	16955781

Manning worksheets (Tables B1 through B6) developed by Navy Center for Cost Analysis program COMET (Cost of Manpower Estimating Tool). Internet on-line, available from http://www.ncca.navy.mil/comet. All costs in current year 2000 dollars.

Inport Watchbill

DUTY SECTION X OF 4 WATCHBILL

COMMAND		SAT/BAF FLEX		PIER SWEEPERS		Duty Driver	
CDO		SAT 1		POIC	**DMAA**	PRIMARY	
SECT LDR		SAT 2		SWEEPER	**E-4 & BELOW**	ALTERNATE	
FPO		BAF 1		SWEEPER		50 CAL FLEX TEAM	
DMAA		BAF 2		SUNSET		50 CAL FLEX	
EDO		BAF 3		SUNRISE		LOADER	
CSOOW		SHORE PATROL				M60 FLEX	
DUTY GM							
DUTY OPS		EMERGENCY RELIEF'S		COLOR GUARD/ DRESS BLUES		LIGHT DETAIL	
DUTY ADMIN		OOD / QD		ENSIGN		OFF PWAY	
DUTY SUPP		TECH		ENSIGN		SONAR 5	
FIRE MARSH				JACK		BRIDGE	

WATCH	0730-1230	1230-1730	1730-2230	2230-0230	0230-0730
OOD 9MM U/I					
TOOW U/I					
ROVER U/I					
QD SENTRY U/I					
QDSENTRY(12)					
TOPSIDE M14					
BRIDGE M14					
PIER RVER M14					
M-60	0800-1400	2000-0200		ANTI-SWIMMER/ RHIB	0200- 0800
Duty shared with sister ship				BOAT "O" COXSWAIN BOW HOOK	

ISOLATION RESPONSE TEAM (H = Hydra)			RAPID RESPONSE TEAM (H = Hydra)			ATTACK TEAM (H = Hydra)		
Incident Cdr			Scene Leader			Team Leader		
DCS Plotter			Investigator			Nozzleman		
Boundary Team			Team Member			Hoseman		
Boundary Team			Electrician			Hoseman		
REP LOCKER						Plugman		

Courtesy of FCCS(SW) Thomas M. Taylor, USN, USS *Yorktown* Combat Systems Department Leading Chief Petty Officer and Duty Section 4 Section Leader.

APPENDIX C

PSU MANNING INFORMATION AND WATCHBILL

MANNING

Department	E1-3	E4	E5	E6	E7	E8	E9	Total
COMBAT SYSTEMS	0	20	18	10	3	0	0	51
ENGINEERING	0	5	11	4	1	1	0	22
EXECUTIVE	1	0	1	1	0	0	0	3
MEDICAL	0	0	1	1	0	0	0	2
OFFICERS	0	0	0	0	0	0	0	0
OPERATIONS	1	16	8	5	0	0	1	31
SUPPLY	0	3	3	2	0	0	0	8
TOTAL	2	44	42	23	4	1	1	117

Department	O1	O2	O3	O4	O5	O6	Total
COMBAT SYSTEMS	0	0	0	0	0	0	0
ENGINEERING	0	0	0	0	0	0	0
EXECUTIVE	0	0	0	0	0	0	0
MEDICAL	0	0	0	0	0	0	0
OFFICERS	0	3	7	2	1	0	13
OPERATIONS	0	0	0	0	0	0	0
SUPPLY	0	0	0	0	0	0	0
TOTAL	0	3	7	2	1	0	13

Department	Enlisted	Officer	Total
COMBAT SYSTEMS	51	0	51
ENGINEERING	22	0	22
EXECUTIVE	3	0	3
MEDICAL	2	0	2
OFFICERS	0	13	13
OPERATIONS	31	0	31
SUPPLY	8	0	8
TOTAL	117	13	130

COSTS

Department	E1-3	E4	E5	E6	E7	E8	E9	Total
COMBAT SYSTEMS	0	1380532	1189125	759570	293393	0	0	3622620
ENGINEERING	0	395921	967850	382352	105990	115947	0	1968059
EXECUTIVE	67132	0	80456	89555	0	0	0	237143
MEDICAL	0	0	77925	86503	0	0	0	164429
OFFICERS	0	0	0	0	0	0	0	0
OPERATIONS	70957	1258908	694016	476323	0	0	129705	2629908
SUPPLY	0	221806	246176	181979	0	0	0	649961
TOTAL	138089	3257167	3255549	1976282	399383	115947	129705	9272121

Department	O1	O2	O3	O4	O5	O6	Total
COMBAT SYSTEMS	0	0	0	0	0	0	0
ENGINEERING	0	0	0	0	0	0	0
EXECUTIVE	0	0	0	0	0	0	0
MEDICAL	0	0	0	0	0	0	0
OFFICERS	0	360697	944979	311012	175228	0	1791917
OPERATIONS	0	0	0	0	0	0	0
SUPPLY	0	0	0	0	0	0	0
TOTAL	0	360697	944979	311012	175228	0	1791917

Department	Enlisted	Officer	Total
COMBAT SYSTEMS	3622620	0	3622620
ENGINEERING	1968059	0	1968059
EXECUTIVE	237143	0	237143
MEDICAL	164429	0	164429
OFFICERS	0	1791917	1791917
OPERATIONS	2629908	0	2629908
SUPPLY	649961	0	649961
TOTAL	9272121	1791917	11064037

Manning worksheets (Figures C-1 through C-6) developed by Navy Center for Cost Analysis program COMET (Cost of Manpower Estimating Tool). Internet on-line, available from http://www.ncca.navy.mil/comet. All costs in current year 2000 dollars.

Watchbill

PSU 305 Watch Quarter and Station Bill

BILLET NUMBER	RANK/ RATE	BILLET NAME	CONDITION III	CONDITION I (MOD)	CONDITION I
A-100-O M9	CDR	CO		OPCEN (PORT)	OPCEN
A-101-O M9	LCDR	XO		OPCEN (STBD)	ALT OPCEN
B-100-O M9	LCDR	OPERATIONS OFFICER DEPT HEAD	CDO SECTION I	CDO (PORT)	CDO
B-200-O M9	LT	BOATS DIV. OFFICER	TPSB TAO SECTION I	TPSB TAO (PORT)	TPSB TAO
B-201-Ox M9	LT	ASSISTANT BOATS DIV. OFFICER	TPSB TAO SECTION II	TPSB TAO (STARBOARD)	ALT OPCEN
B-300-O M9	LT	SECURITY OFFICER/ PLT LEADER		SECURITY CP I/C (PORT)	SECURITY CP
B-104-O M9	LT	ASST SEC OFF/ ASST PLT LDR	ALT DEFENSE OFFICER SECURITY CP SECTION II	SECURITY CPI /C (STBD)	ALT SECURITY CP
C-100-O	LT	ENGINEER OFFICER ENG DEPT HEAD	CDO SECTION II	CDO (STBD)	DAMAGE CONTROL OINC
D-100-O M9	LT(AD)	LOGISTICS OFFICER ADMIN DEPT HEAD	CDO SECTION III	BOAT DOCKS I/C (STBD)	ALT OPCEN CDO
D-300-O M9	LT	MEDICAL OFFICER DIV. OFFICER	SICK CALL	AID STATION (PORT)	AID STATION I/C
C-300-O	LTJG	WEAPONS OFFICER DIV. OFFICER	SECURITY CP SECTION III	ALT OPCEN (STBD)	OPCEN ADMIN
B-400-O M9	LTJG	COMMS OFFICER DIV. OFFICER	TPSB TAO SECTION II	TPSB TAO (STBD)	TACTICAL SIGNAL OFF (OPCEN)
D-400-Ox M9	LTJG	ADMIN OFFICER PAY/PERS DIV. OFF	OPCEN ADMIN SECTION III	ALT OPCEN (PORT)	ALT OPCEN

COMMS					
		COMMS OFFICER DIV. OFFICER	TPSB TAO SECTION II	TPSB TAO (STBD)	TACTICAL SIGNAL OFF (OPCEN)
B-410-E M9/M203	TC1	TCIC	TCIC	OPCEN TSO (PORT)	OPCEN COMMS
B-411-E M16	TC2	COMMS	COMMS SECTION I	OPCEN TSO (STBD)	ALT OPCEN COMMS
B-412-E M16	TC2	COMMS	COMMS SECTION II	OPCEN COMMS (PORT)	OPCEN COMMS
B-413-E M16	TC3	COMMS	COMMS SECTION III	OPCEN COMMS (STBD)	ALT OPCEN COMMS
B-414-Ex M16/M203	TC3	COMMS	COMMS SECTION I	OPCEN COMMS (PORT)	OPCEN COMMS
BOATS					
		BOAT DIV. OFFICER	TPSB TAO SECTION I	TPSB TAO (PORT)	TPSB TAO
		ASSISTANT BOATS DIV. OFFICER	TPSB TAO SECTION II	TPSB TAO (STARBOARD)	ALT OPCEN
B-210-E M9	BMCM	BOAT DIV CPO	TPSB TAO SECTION III	BOAT DOCKS I/C PORT	BOAT DOCKS
B-211-E M9	BM1	COXSWAIN/ SECTION LEADER	COXSWAIN SECTION I BOATCREW 1	COXSWAIN BOAT 1 (PORT)	COXSWAIN BOAT 1
B-213-E M16	BM3	CREWMAN	CREWMAN SECTION I BOATCREW 1	CREWMAN BOAT 1 (PORT)	CREWMAN BOAT 1
B-214-E M16	PS3	CREWMAN	CREWMAN SECTION I BOATCREW 1	CREWMAN BOAT 1 (PORT)	CREWMAN BOAT 1

B-212-E M16	MK1	ENGINEER	ENGINEER SECTION I BOATCREW 1	ENGINEER BOAT 1 (PORT)	ENGINEER BOAT 1
B-216-E M9	BM2	COXSWAIN	COXSWAIN SECTION I BOATCREW 2	COXSWAIN BOAT 2 (PORT)	COXSWAIN BOAT 2
B-218-E M16	BM3	CREWMAN	CREWMAN SECTION I BOATCREW 2	CREWMAN BOAT 2 (PORT)	CREWMAN BOAT 2
B-219-E M16 (SHTGN?)	PS3	CREWMAN	CREWMAN SECTION I BOATCREW 2	CREWMAN BOAT 2 (PORT)	CREWMAN BOAT 2
B-217-E M16	MK2	ENGINEER	ENGINEER SECTION I BOATCREW 2	ENGINEER BOAT 2 (PORT)	ENGINEER BOAT 2
B-221-E M9	BM2	COXSWAIN	COXSWAIN SECTION I BOATCREW 3	COXSWAIN BOAT 3 (PORT)	COXSWAIN BOAT 3
B-223-E M16	BM3	CREWMAN	CREWMAN SECTION I BOATCREW 3	CREWMAN BOAT 3 (PORT)	CREWMAN BOAT 3
B-224-E M16 (SHTGN?)	PS3	CREWMAN	CREWMAN SECTION I BOATCREW 3	CREWMAN BOAT 3 (PORT)	CREWMAN BOAT 3
B-222-E M16	MK2	ENGINEER	ENGINEER SECTION I BOATCREW 3	ENGINEER BOAT 3 (PORT)	ENGINEER BOAT 3
B-226-E M9	BM3	COXSWAIN	COXSWAIN SECTION I BOATCREW 4	COXSWAIN BOAT 4 (PORT)	COXSWAIN BOAT 4
B-228-E M16	BM3	CREWMAN	CREWMAN SECTION I BOATCREW 4	CREWMAN BOAT 4 (PORT)	CREWMAN BOAT 4
B-229-E M16 (SHTGN?)	PS3	CREWMAN	CREWMAN SECTION I BOATCREW 4	CREWMAN BOAT 4 (PORT)	CREWMAN BOAT 4
B-227-E M16	MK3	ENGINEER	ENGINEER SECTION I BOATCREW 4	ENGINEER BOAT 4 (PORT)	ENGINEER BOAT 4
B-231-E M9	BM1 (AD)	COXSWAIN/ SECTION LEADER	COXSWAIN SECTION II BOATCREW 5	COXSWAIN BOAT 5 (PORT)	COXSWAIN BOAT 5
B-233-E M16	BM3	CREWMAN	CREWMAN SECTION II BOATCREW 5	CREWMAN BOAT 5 (PORT)	CREWMAN BOAT 5

B-234-E M16 (SHTGN?)	PS3	CREWMAN	CREWMAN SECTION II BOATCREW 5	CREWMAN BOAT 5 (PORT)	CREWMAN BOAT 5
B-232-E M16	MK1	ENGINEER	ENGINEER SECTION II BOATCREW 5	ENGINEER BOAT 5 (PORT)	ENGINEER BOAT 5
B-236-E M9	BM2	COXSWAIN	COXSWAIN SECTION II BOATCREW 6	COXSWAIN BOAT 6 (PORT)	COXSWAIN BOAT 6
B-238-E M16	BM3	CREWMAN	CREWMAN SECTION II BOATCREW 6	CREWMAN BOAT 6 (PORT)	CREWMAN BOAT 6
B-239-E M16	PS3	CREWMAN	CREWMAN SECTION II BOATCREW 6	CREWMAN BOAT 6 (PORT)	CREWMAN BOAT 6
B-237-E M16	MK3	ENGINEER	ENGINEER SECTION II BOATCREW 6	ENGINEER BOAT 6 (PORT)	ENGINEER BOAT 6
B-241-E M9	BM2	COXSWAIN	COXSWAIN SECTION II BOATCREW 7	COXSWAIN BOAT 7 (STBD)	SECURITY TEAM 1
B-243-E M16	BM3	CREWMAN	CREWMAN SECTION II BOATCREW 7	CREWMAN BOAT 7 (STBD)	SECURITY TEAM 1 CREW WPN
B-244-E M16	PS3	CREWMAN	CREWMAN SECTION II BOAT CREW 7	CREWMAN BOAT 7 (STBD)	SECURITY TEAM 1 CREW WPN
B-242-E M16	MK2	ENGINEER	ENGINEER SECTION II BOATCREW 7	ENGINEER BOAT 7 (STBD)	SECURITY TEAM 1 CREW WPN
B-246-E M9	BM2	COXSWAIN	COXSWAIN SECTION II BOATCREW 8	COXSWAIN BOAT 8 (STBD)	SECURITY TEAM 1
B-248-E M16	BM3	CREWMAN	CREWMAN SECTION II BOATCREW 8	CREWMAN BOAT 8 (STBD)	SECURITY TEAM 1 CREW WEAPON
B-249-E M16	PS3	CREWMAN	CREWMAN SECTION II BOATCREW 8	CREWMAN BOAT 8 (STBD)	SECURITY TEAM 1 CREW WEAPON
B-247-E M16	MK2	ENGINEER	ENGINEER SECTION II BOATCREW 8	ENGINEER BOAT 8 (STBD)	SECURITY TEAM 1 CREW WEAPON
B-251-E M9	BM1	COXSWAIN/ SECTION LEADER	COXSWAIN SECTION III BOATCREW 9	COXSWAIN BOAT 9 (STBD)	SECURITY TEAM 2
B-253-E M16	BM3	CREWMAN	CREWMAN SECTION III	CREWMAN BOAT 9 (STBD)	SECURITY TEAM 2 CREW WEAPON

			BOATCREW 9		
B-254-E M16	PS3	CREWMAN	CREWMAN SECTION III BOATCREW 9	CREWMAN BOAT 9 (STBD)	SECURITY TEAM 2 CREW WEAPON
B-252-E M16	MK2	ENGINEER	ENGINEER SECTION III BOATCREW 9	ENGINEER BOAT 9 (STBD)	SECURITY TEAM 2 CREW WEAPON
B-256-E M9	BM2	COXSWAIN	COXSWAIN SECTION III BOATCREW 10	COXSWAIN BOAT 10 (STBD)	SECURITY TEAM 2
B-258-E M16	BM3	CREWMAN	CREWMAN SECTION III BOATCREW 10	CREWMAN BOAT 10 (STBD)	SECURITY TEAM 2 CREW WEAPON
B-259-E M16	PS3	CREWMAN	CREWMAN SECTION III BOATCREW 10	CREWMAN BOAT 10 (STBD)	SECURITY TEAM 2 CREW WEAPON
B-257-E M16	MK2	ENGINEER	ENGINEER SECTION III BOATCREW 10	ENGINEER BOAT 10 (STBD)	SECURITY TEAM 2 CREW WEAPON
B-261-E M9	BM1	COXSWAIN	COXSWAIN SECTION III BOATCREW 11	COXSWAIN BOAT 11 (STBD)	SECURITY TEAM 3
B-263-E M16	BM3	CREWMAN	CREWMAN SECTION III BOATCREW 11	CREWMAN BOAT 11 (STBD)	SECURITY TEAM 3 CREW WEAPON
B-264-E M16	PS3	CREWMAN	CREWMAN SECTION III BOATCREW 11	CREWMAN BOAT 11 (STBD)	SECURITY TEAM 3 CREW WEAPON
B-262-E M16	MK3	ENGINEER	ENGINEER SECTION III BOATCREW 11	ENGINEER BOAT 11 (STBD)	SECURITY TEAM 3 CREW WEAPON
B-266-E M9	BM3	COXSWAIN	COXSWAIN SECTION III BOATCREW 12	COXSWAIN BOAT 12 (STBD)	SECURITY TEAM 3
B-268-E M16	BM3	CREWMAN	CREWMAN SECTION III BOATCREW 12	CREWMAN BOAT 12 (STBD)	SECURITY TEAM 3 CREW WEAPON
B-269-E M16	PS3	CREWMAN	CREWMAN SECTION III BOATCREW 12	CREWMAN BOAT 12 (STBD)	SECURITY TEAM 3 CREW WEAPON
B-267-E M16	MK3	ENGINEER	ENGINEER SECTION III BOATCREW 12	ENGINEER BOAT 12 (STBD)	SECURITY TEAM 3 CREW WEAPON

		SECURITY			
		SECURITY OFFICER/ PLT LEADER	DEFENSE OFFICER SECURITY CP SECTION I	SECURITY CP I/C (PORT)	SECURITY CP
		ASST SEC OFF/ ASST PLT LDR	SECURITY CP SECTION II	SECURITY CPI/C (STBD)	ALT SECURITY CP
B-310-E M9	PSC	SENIOR SECURITY CPO SECURITY CP SECTION III	SECURITY OFFICER SECURIY CP SECTION III	UNIT SECURITY TEAM SECURITY CP	SECURITY CP
B-311-E M16	PS1	SECURITY TEAM 1 LDR/ FIRE TEAM LEADER	SECURITY TM, SEC I FIRE TEAM 1	SECURITY TM FIRE TM 1 LDR, PORT	SECURITY TM , AREA 1 FIRE TEAM 1 LDR
B-312-E M16	PS1	ASST SECTY TM 1 LDR/ FIRE TEAM LEADER	SECURITY TEAM, SEC I FIRE TM 2	SECURITY TM FIRE TM 2 LDR, PORT	SECURITY TM, AREA 1 FIRE TM 2 LDR
B-313-E M16	PS2	SECURITY TEAM 1	SECURITY TM, SEC I FIRE TM 1	SECURITY TM FIRE TM 1, PORT	SECURITY TM, AREA 1 FIRE TM 1
B-314-E M16	PS2	SECURITY TEAM 1	SECURITY TEAM, SEC I FIRE TM 1	SECURITY TM FIRE TM 1 PORT	SECURITY TM, AREA 1 FIRE TM 1
B-315-E M203	PS2	SECURITY TEAM 1	SECURITY TM, SEC I FIRE TM 1	SECURITY TM FIRE TM 1, PORT	SECURITY TM, AREA 1 FIRE TM 1
B-316-E M203	PS2	SECURITY TEAM 1	SECURITY TM, SEC I FIRE TM 2	SECURITY TM FIRE TM 2, PORT	SECURITY TM, AREA 1 FIRE TM 2
B-317-E M16	PS3	SECURITY TEAM 1	SECURITY TM, SEC I FIRE TM 2	SECURITY TM FIRE TM 2, PORT	SECURITY TM, AREA 1 FIRE TM 2
B-318-E M16	PS3	SECURITY TEAM 1	SECURITY TM, SEC I FIRE TM 2	SECURITY TM FIRE TM 2, PORT	SECURITY TM, AREA 1 FIRE TM 2
B-326-E M16	PS1	SECURITY TM 2 LDR/ FIRE TEAM LEADER	SECURITY TM, SEC II FIRE TM 1	SECURITY TM FIRE TM 1 LDR, STBD	SECURITY TM, AREA 2 FIRE TM 1 LDR
B-327-E M16	PS1	ASST SEC TM 2 LDR/ FIRE TEAM LEADER	SECURITY TM, SEC II FIRE TM 2	SECURITY TM FIRE TM 2 LDR, STBD	SECURITY TM, AREA 2 FIRE TM 2 LDR
B-328-E M203	PS2	SECURITY TEAM 2	SECURITY TM, SEC II FIRE TM 1	SECURITY TM FIRE TM 1, STBD	SECURITY TM, AREA 2 FIRE TM 1

B-329-E M16	PS2	SECURITY TEAM 2	SECURITY TM, SEC II FIRE TM 1	SECURITY TM FIRE TM 1, STBD	SECURITY TM, AREA 2 FIRE TM 1
B-330-E M16	PS2	SECURITY TEAM 2	SECURITY TM, SEC II FIRE TM 1	SECURITY TM FIRE TM 1, STBD	SECURITY TM, AREA 2 FIRE TM 1
B-331-E M16	PS2	SECURITY TEAM 2	SECURITY TM, SEC II FIRE TM 2	SECURITY TM FIRE TM 2, STBD	SECURITY TM, AREA 2 FIRE TM 2
B-332-E M203	PS3	SECURITY TEAM 2	SECURITY TM, SEC II FIRE TM 2	SECURITY TM FIRE TM 2, STBD	SECURITY TM, AREA 2 FIRE TM 2
B-333-E M16	PS3	SECURITY TEAM 2	SECURITY TM, SEC II FIRE TM 2	SECURITY TM FIRE TM 2, STBD	SECURITY TM, AREA 2 FIRE TM 2
B-341-E M16	PS1	SECURITY TM 3 LDR/ FIRE TEAM LEADER	SECURITY TM, SEC III FIRE TM 1	SECURITY TM FIRE TM 3 LDR, STBD	SECURITY TM, AREA 3 FIRE TM 1 LDR
B-342-E M16	PS1	ASST SECTY TM 3 LDR/ FIRE TEAM LEADER	SECURITY TM, SEC III FIRE TM 2	SECURITY TM FIRE TM 3 LDR, PORT	SECURITY TM, AREA 3 FIRE TM 2 LDR
B-343-E M16	PS2	SECURITY TEAM 3	SECURITY TM, SEC III FIRE TM 1	SECURITY TM FIRE TM 3, STBD	SECURITY TM, AREA 3 FIRE TM 1
B-344-E M16	PS2	SECURITY TEAM 3	SECURITY TM, SEC III FIRE TM 1	SECURITY TM FIRE TM 3, PORT	SECURITY TM, AREA 3 FIRE TM 1
B-345-E M203	PS2	SECURITY TEAM 3	SECURITY TM, SEC III FIRE TM 1	SECURITY TM FIRE TM 3, STBD	SECURITY TM, AREA 3 FIRE TM 1
B-346-E M203	PS2	SECURITY TEAM 3	SECURITY TM, SEC III FIRE TM 2	SECURITY TM FIRE TM 3, PORT	SECURITY TM, AREA 3 FIRE TM 2
B-347-E M16	PS3	SECURITY TEAM 3	SECURITY TM, SEC III FIRE TM 2	SECURITY TM FIRE TM 3, STBD	SECURITY TM, AREA 3 FIRE TM 2
B-348-E M16	PS3	SECURITY TEAM 3	SECURITY TM, SEC III FIRE TM 2	SECURITY TM FIRE TM 3, PORT	SECURITY TM, AREA 3 FIRE TM 2
		ENGINEERING			

		ENGINEER OFFICER ENG DEPT HEAD	CDO SECTION II	CDO (STBD)	DAMAGE CONTROL OINC
C-200-E M9	MKCS	ENG DIV CPO	ENGINEERING WATCH OFFICER SECTION I	EWO (PORT)	BOAT REPAIR
C-210-E M9	MKC	ENGRNG SUPPORT	ENGINEERING SUPPORT SECTION I	ENGINEERING SUPPORT (PORT)	BOAT REPAIR
C-211-E M16	MK1 (AD)	ENGRNG SUPPORT	ENGINEERING SUPPORT SECTION II	ENGINEERING SUPPORT (STBD)	BOAT REPAIR
C-212-E M16	MK2	ENGRNG SUPPORT	ENGINEERING SUPPORT SECTION III	DAMAGE CONTROL TEAM (PORT)	DAMAGE CONTROL TEAM
C-213-E M16	MK2	ENGRNG SUPPORT	ENGINEERING SUPPORT SECTION I	DAMAGE CONTROL TEAM (STBD)	DAMAGE CONTROL TEAM
C-231-E M16	DC1	ENGRNG SUPPORT DAMAGE CONTROL	ENGINEERING SUPPORT SECTION I	DAMAGE CONTROL TM LDR (PORT)	DAMAGE CONTROL TEAM LDR
C-232-E M16	DC2	ENGRNG SUPPORT DAMAGE CONTROL	ENGINEERING SUPPORT SECTION II	DAMAGE CONTROL TM LDR (STBD)	DAMAGE CONTROL TEAM
C-233-E M16	DC3	ENGRNG SUPPORT DAMAGE CONTROL	ENGINEERING SUPPORT SECTION III	DAMAGE CONTROL TM (PORT)	DAMAGE CONTROL TEAM
C-412-E M16	EM2	ENGRNG SUPPORT ELECTRICS	ENGINEERING SUPPORT SECTION I	DAMAGE CONTROL TM (STBD)	DAMAGE CONTROL TEAM
C-410-E M16	ETC	ELECTRONICS DIV CPO	ENGINEERING WATCH OFFICER SECTION II	ENGINEERING WATCH OFFICER (STBD)	BOAT REPAIR
C-411-E M16	ET1	ELECTRONICS SUPPORT TEAM	ENGINEERING SUPPORT SECTION I	ENGINEERING SUPPORT (PORT)	COMMS SUPPORT (OPCEN)
C-413-E M16	ET3	ELECTRONICS SUPPORT TEAM	ENGINEERING SUPPORT SECTION III	DAMAGE CONTROL TEAM (STBD)	DAMAGE CONTROL TEAM
		WEAPONS			

		WEAPONS OFFICER DIV. OFFICER	SECURITY CP SECTION III	ALT OPCEN (STBD)	OPCEN ADMIN
C-310-E M9	GMC	WEAPONS SUPPORT	ENGINEERING SUPPORT SECTION I	WEAPONS SUPPORT (PORT)	SECURITY CP
C-311-E M9	GM1 (AD)	WEAPONS SUPPORT	ENGINEERING SUPPORT SECTION II	WEAPONS SUPPORT (STBD)	ALT SECURITY CP
C-312-E M9	GM2	WEAPONS SUPPORT	ENGINEERING SUPPORT SECTION III	WEAPONS SUPPORT (PORT)	SECURITY
C-313-E M9	GM3	WEAPONS SUPPORT	ENGINEERING SUPPORT SECTION I	WEAPONS SUPPORT (STBD)	SECURITY
C-314-Ex M9 SHTGUN	GM2	WEAPONS SUPPORT	ENGINEERING SUPPORT SECTION II	WEAPONS SUPPORT (PORT)	SECURITY
ADMIN					
		LOGISTICS OFFICER ADMIN DEPT HEAD	CDO SECTION III	BOAT DOCKS I/C (STBD)	ALT OPCEN CDO
		ADMIN OFFICER PAY/PERS DIV. OFF	OPCEN ADMIN SECTION III	ALT OPCEN (PORT)	ALT OPCEN
D-210-E M16	SK1 (AD)	SUPPLY SUPPORT	OPCEN ADMIN SECTION I	SECURITY TEAM 1 (PORT)	OPCEN ADMIN SUPPORT
D-211-E M16	SK2	SUPPLY SUPPORT	OPCEN ADMIN SECTION II	OPCEN ADMIN SUPPORT (STBD)	SECURITY CP (PLT LDR RTO)
D-410-E M16	YN1	ADMIN SUPPORT DIV CPO	OPCEN ADMIN SECTION III	SECURITY TEAM 2 (STBD)	OPCEN ADMIN SUPPORT
D-411-E M16	YN2	ADMIN SUPPORT	OPCEN ADMIN SECTION I	OPCEN ADMIN SUPPORT (STBD)	ALT SECURITY CP (ASST PLT LDR RTO)
D-412-E M16	SN	GENERAL SUPPORT	SECURITY TEAM 1st SQUAD (RTO)	SECURITY TM 1 (PORT) (TEAM LDR RTO)	SECURITY TEAM 1 (TM LDR RTO)

D-413-E M16	SN	GENERAL SUPPORT	SECURITY TEAM 2nd SQUAD (RTO)	SECURITY TM 2 (STBD) (TEAM LDR RTO)	SECURITY TEAM 2 (TM LDR RTO)
D-510-E M9	FS1	FS DIV CPO	MESS HALL I/C	MESS HALL I/C (PORT)	AID STATION STRETCHER BEARER
D-511-E M16	FS2	FS SUPPORT	MESS HALL	MESS HALL I/C (STBD)	AID STATION STRETCHER BEARER
D-512-E M16	FS2	FS SUPPORT	MESS HALL	MESS HALL (PORT)	AID STATION STRETCHER BEARER
D-513-E M16	FS3	FS SUPPORT	MESS HALL	MESS HALL (STBD)	AID STATION STRETCHER BEARER
D-514-E M16	FS3	FS SUPPORT	MESS HALL	SECURITY TM 1 (PORT) (OPCEN RUNNER)	DAMAGE CONTROL TEAM
D-515-E M16	FS3	FS SUPPORT IN TRAINING	MESS HALL	SECURITY TM 2(STBD) (OPCEN RUNNER)	DAMAGE CONTROL TEAM
		MEDICAL			
		MEDICAL DIV OFF	SICK CALL	AID STATION (PORT)	AID STATION I/C
D-310-E M9	HS1	MEDICAL SUPPORT	SICK CALL	AID STATION (STBD)	AID STATION
D-311-E M9	HS2	MEDICAL SUPPORT	SICK CALL	AID STATION ASST (PORT)	AID STATION STRETCHER BEARER

PSU 305 WQSB courtesy of LCDR Lee A. Handford, USCGR, Executive Officer, PSU 305.

PSU Master Training List

Billet attending	Course ID	Course Title	Duration
ALL HANDS	PSU-1 Skills	PSU Basic Defensive Skills	12 days
	PSU TSTA	PSU Tailored Skills TRAV	12 days
	AT/FP	AT/FP Level 1	1 day
	PSUESH	PSU Essential Skills Handbook Non-resident course	N/A
ALL SEC TM	AMC PR	PHOENIX READINESS	14 days
	BAMAP	Basic Map Reading Skills Nonresident course	N/A
ALL BOAT DIVS	PSU-2	TPSB Ops and Tactics Course	12 days
Security Officer	J-830-0015	Force Protection Officer Course	5 days
Asst Security Officer	J-830-0010	Anti-Terrorism Training Course	5 days
Boarding Team Members			
Boarding Officers (Officers/BMC/BM1)	MLE-01	MLE Boarding Officer	32 days
Boarding Team Members (BM2/BM3)	MLE-02	MLE Boarding Team Member	12 days
Weapons Support			
GMC/GM1/GM2	J-041-0103	Ammunition Management	5 days
	SAI/CG-024	Small Arms Instructor	19 days

USCG Estimated PSU Deployment Costs

Description of Cost	Cost Equation	Total Cost	Comments
Personnel Salary Costs:			117 person WQSB from COMDTINST M3501.53,
O-5 (one)	$4800/mth X 6mths + 1227BHA X 6mths	$36,162	PSU Operational Doctrine
O-4 (three)	$4400/mth X 6mths + 1087BHA X 6mths	$98,766	
O-3 (two)	$3900/mth X 6mths + 1000BHA X 6mths	$58,800	
O-2 (two)	$3200/mth X 6mths + 786BHA X 6mths	$47,832	Estimates include: Base Pay
CWO (three)	$3500/mth X 6mths + 786BHA X 6mths	$77,148	BHA
E-7 (twelve)	$2500/mth X 6mths + 824BHA X 6mths	$239,328	
E-6 (sixteen)	$2200/mth X 6mths + 788BHA X 6mths	$286,848	
E-5 (nineteen)	$2000/mth X 6mths +720BHA X 6mths	$310,080	
E-4 (fifty nine)	$1700/mth X 6mths + 664BHA X 6mths	$836,856	
Total Estimated Salary :		**$1,991,820**	
Berthing:			
Field Conditions:	No Cost - self sustaining	$0	Tent City/cots
BEQ	Avg $7/ea (106 enlisted) * 180 days	$133,560	
BOQ	Avg $10/ea (11 officers) * 180 days	$19,800	
Hotel (local economy)	Avg $35/night X 60 rooms X 180 days	$378,000	2 members per room = (117/2) = 60 rooms
Equipment Costs:			
Uniforms	Provided to troops/no cost	$0	Climate may require additional cold wx gear
CBR gear/equipment	Provided to troops/no cost	$0	CINC requirements vary
Generators (three) - POL	Run 24 hours/7 days a week		Includes tent city/OPCEN
	60gal/day (diesel) X 180 days ($1/gal)	$10,800	Diesel fuel cost for generators
	$5/day X 180 days (misc gen fuel costs)	$900	(anti freeze, oil)
Vehicles (three trucks) - POL	Run 24 hours/7 days a week		
	60gal/day (mogas) X 180 days ($1.5/gal)	$16,200	Vehicle fuel (87 octane)

	$50/day X 180 days (misc veh fuel costs)	$9,000	(transmission, steering, brake fluids, oil, antifreeze)
Forklift	Support Costs (estimate) X 180 days	$5,000	(hydraulics, trans, steering, brake fluids, fuel, etc)
Boats (six 22' TPSBs)	Run 24 hours/7 days a week		
	100gal/day per boat X 6boats X 180days	$162,000	87 octane mogas at $1.50/gal
	3gal/day per boat X 6 boats X 180 days	$51,840	Type III VRO oil ($2.00/gal)
Total Equipment:		**$255,740**	
Consumables:			
Galley (not PSU operated)	Breakfast at $1.10/day X 180 days X 117	$23,166	US Military Galley/Chow Hall/Mess
	Lunch at $2.10/day X 180 days X 117	$44,226	US Military Galley/Chow Hall/Mess
	Dinner at $3.25/day X 180 days X 117	$68,445	US Military Galley/Chow Hall/Mess
MREs	Case = $25 1cs/day X 180 days	$4,500	For watchstanders/boat crews
Total Consumables:		**$140,337**	
Potable Water	PSU comes with H2O storage capability	$0	PSU requires a source for potable water
	Bottled water = 1/gal per person per day	**$16,848**	$0.80/gal off the shelf/bottled
Medical Support	Trauma emergencies packaged by unit	$0	
	Sick call/Field Medicine limited within unit	$0	
	Access to military clinic facilities preferred	$0	
Communications Support	Organic to PSU - no cost	$0	
Weapons/ammunition support	Organic to PSU - no cost	$0	
Admin support	Organic to PSU/OPCON - no cost	$0	
Engineering Support	Organic to PSU - no cost	$0	
Personnel Administration - less salaries	Organic to PSU/OPCON - no cost	$0	
CASREP/maintenance support	Organic to PSU/MLC - no cost	$0	

Package One		
	Personnel Salaries	$1,991,820
	Berthing - Field Conditions	$0
	Equipment/POL Requirements	$255,740
	Consumables/Messing	$140,337
	Potable Water	$16,848
	Total:	**$2,404,745**

Package Two		
	Personnel Salaries	$1,991,820
	Berthing - BOQ/BEQ	$153,360
	Equipment/POL Requirements	$255,740
	Consumables/Messing	$140,337
	Potable Water	$16,848
	Total:	**$2,558,105**

Package Three		
	Personnel Salaries	$1,991,820
	Berthing - Hotel/local economy	$378,000
	Equipment/POL Requirements	$255,740
	Consumables/Messing	$140,337
	Potable Water	$16,848
	Total:	**$2,782,745**

Deployment costs provided by LT(jg) Cheryl Honeycutt, USCG, USCG Atlantic Area PSU Coordinator.

APPENDIX D

DD (X) MANNING INFORMATION

Department	E1-3	E4	E5	E6	E7	E8	E9	Total
COMBAT SYSTEMS	0	2	8	3	3	0	0	16
ENGINEERING	2	0	7	3	3	0	0	15
MEDICAL	0	0	0	0	1	0	0	1
OFFICERS	0	0	0	0	0	0	0	0
OPERATIONS	5	6	14	5	1	0	0	31
SUPPLY	0	0	3	0	1	0	0	4
TOTAL	7	8	32	11	9	0	0	67

Department	O1	O2	O3	O4	O5	O6	Total
COMBAT SYSTEMS	0	0	0	0	0	0	0
ENGINEERING	0	0	0	0	0	0	0
MEDICAL	0	0	0	0	0	0	0
OFFICERS	2	1	3	3	1	0	10
OPERATIONS	0	0	0	0	0	0	0
SUPPLY	0	0	0	0	0	0	0
TOTAL	2	1	3	3	1	0	10

Department	Enlisted	Officer	Total
COMBAT SYSTEMS	16	0	16
ENGINEERING	15	0	15
MEDICAL	1	0	1
OFFICERS	0	10	10
OPERATIONS	31	0	31
SUPPLY	4	0	4
TOTAL	67	10	77

Manning costs

Department	E1-3	E4	E5	E6	E7	E8	E9	Total
COMBAT SYSTEMS	0	150456	530380	295475	312745	0	0	1289055
ENGINEERING	141914	0	668708	284474	327145	0	0	1422242
MEDICAL	0	0	0	0	95139	0	0	95139
OFFICERS	0	0	0	0	0	0	0	0
OPERATIONS	364336	485768	1235392	497329	104080	0	0	2686905
SUPPLY	0	0	249189	0	100284	0	0	349473
TOTAL	506250	636224	2683670	1077278	939393	0	0	5842814

Department	O1	O2	O3	O4	O5	O6	Total
COMBAT SYSTEMS	0	0	0	0	0	0	0
ENGINEERING	0	0	0	0	0	0	0
MEDICAL	0	0	0	0	0	0	0
OFFICERS	211407	120232	405158	464414	175228	0	1376439
OPERATIONS	0	0	0	0	0	0	0
SUPPLY	0	0	0	0	0	0	0
TOTAL	211407	120232	405158	464414	175228	0	1376439

Department	Enlisted	Officer	Total
COMBAT SYSTEMS	1289055	0	1289055
ENGINEERING	1422242	0	1422242
MEDICAL	95139	0	95139
OFFICERS	0	1376439	1376439
OPERATIONS	2686905	0	2686905
SUPPLY	349473	0	349473
TOTAL	5842814	1376439	7219253

Manning with additional security force

Department	E1-3	E4	E5	E6	E7	E8	E9	Total
COMBAT SYSTEMS	6	12	19	9	3	0	0	49
ENGINEERING	2	0	7	3	3	0	0	15
MEDICAL	0	0	0	0	1	0	0	1
OFFICERS	0	0	0	0	0	0	0	0
OPERATIONS	5	6	14	5	1	0	0	31
SUPPLY	0	0	3	0	1	0	0	4
TOTAL	13	18	43	17	9	0	0	100

Department	Enlisted	Officer	Total
COMBAT SYSTEMS	49	0	49
ENGINEERING	15	0	15
MEDICAL	1	0	1
OFFICERS	0	10	10
OPERATIONS	31	0	31
SUPPLY	4	0	4
TOTAL	100	10	110

Costs with additional security personnel

Department	E1-3	E4	E5	E6	E7	E8	E9	Total
COMBAT SYSTEMS	0	832357	1347904	792565	312745	0	0	3285570
ENGINEERING	141914	0	668708	284474	327145	0	0	1422242
MEDICAL	0	0	0	0	95139	0	0	95139
OFFICERS	0	0	0	0	0	0	0	0
OPERATIONS	364336	485768	1235392	497329	104080	0	0	2686905
SUPPLY	0	0	249189	0	100284	0	0	349473
TOTAL	506250	1318125	3501193	1574368	939393	0	0	7839328

Total manning costs with additional security personnel

Department	Enlisted	Officer	Total
COMBAT SYSTEMS	3285570	0	3285570
ENGINEERING	1422242	0	1422242
MEDICAL	95139	0	95139
OFFICERS	0	1376439	1376439
OPERATIONS	2686905	0	2686905
SUPPLY	349473	0	349473
TOTAL	7839328	1376439	9215768

Manning worksheets (Figures D-1 through D-10) developed by Navy Center for Cost Analysis program COMET (Cost of Manpower Estimating Tool). Internet on-line, available from http://www.ncca.navy.mil/comet. All costs in current year 2000 dollars.

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